American Anthropologist

NEW SERIES

VOL. 3 JANUARY–MARCH, 1901 NO. 1

MAN'S PLACE IN NATURE [1]

BY W J McGEE

In the opening paragraphs of his most memorable contribution to knowledge (*Man's Place in Nature*, 1863) Huxley made mention of certain similarities between the activities of anthropoids and those of men; and while the burden of the work was devoted to structural homologies, the initial keynote was retouched here and there throughout the discussion. Huxley's classic contribution to anthropology needs no encomium; it was a pioneer's milemark of progress, erected under difficulties; and it suffices that all later travelers have found it in the direct way of experiential truth. Yet it is worth while now and then to take stock of advances subsequent to, and largely consequent on, the Huxleian declaration.

Since Huxley's pioneer work, a host of investigators have carried forward the study of structural homologies connecting the genus *Homo* with lower genera and orders; and today the physical similarities are among the commonplaces of knowledge, whatsoever the background of philosophical opinion concerning

[1] Address of the retiring President of the Anthropological Society of Washington, delivered before the Washington Academy of Sciences and Affiliated Societies, February 26, 1901.

cause and sequence. During the last decade or two the investigators themselves, with scarce an exception, have gone one step further, and now include sequence of development from lower to higher forms as among the commonplaces of opinion, whatsoever the background of metaphysical notion as to cause. There the strictly biologic aspect of the question as to man's place in nature may safely be considered to rest; there has been little advance in opinion beyond that of the pioneer in 1863; but the data have been multiplied, and the knowledge and opinion have been diffused widely.

Since Huxley's epoch-marking memoir was first published, occasional contributions have been made to knowledge of the activities displayed by various sub-human animals, and during the last quarter of the nineteenth century a science (which has been called the New Ethnology) has been organized to deal with the activities of mankind; yet singularly little has been done in the way of tracing activital homologies between the genus *Homo* and lower genera. It is indeed conventional for sociologists, and customary for comprehensive writers on anthropology, to instance the social habits of mammals and birds, and even of insects and infusoria, as analogous to human society; one naturalist has gone so far as to study various mammals and birds in their activital aspects, thereby opening a most attractive field in science as well as in literature; but no investigators have turned seriously toward the habitual activities displayed by the anthropoids — still less have comparative studies been made of the activities normal to both the higher quadrumana and the lower races of mankind, albeit this is perhaps the most inviting field now open to research. Thus far this line of inquiry grovels in the stage of travelers' tales; the gorilla-hunter tells how the family sire sleeps at the foot of a tree in which mother and young are nested, the naturalist in Liberia incidentally describes the use by monkeys of stick and stone implements, while the Bornean tourist tells of the simian servant who prefers the society of human masters to that of his

kin and discriminates among the garments he is permitted to wear; but there is a woful dearth of critical observation and a lamentable lack of judicious generalization pertaining to this promising meeting-ground of zoölogy and anthropology. So this aspect, too, of the great question concerning man's place in nature remains nearly as it was left by Huxley; the data are more abundant, and opinion has been both clarified and diffused; yet definite homologies remain practically unfound, if not unsought, and the scattered facts have thrown little light on cause, less on sequence.

Since Huxley's prime, the New Ethnology has arisen; and it has opened a vista of facts and relations which apparently escaped the keen vision of the pioneer in 1863 — the vista embracing thought, with all the other psychic factors pertaining to the activities, sub-human as well as human. This vista is perhaps the broadest and most attractive ever opened by science: When Galileo descried the harmonious paths of the planets in a sun-centered system, he raised the minds of men to a new plane; when Newton grasped the idea of gravitation, he gave human thought a new hold on nature; when Darwin discerned the lines of specific development, he wrought a revolution in the world of intellect; but when students still living scanned the lines of activital development and realized that thought itself is bred by the very activities over which it comes later to hold dominion, they opened a new intellectual world — a world at once so novel and so commanding that some of the students themselves are fain to sit at the gate and view the prospect as fleeting phantasm rather than veritable reality. Nor is their hesitation either unprecedented or unpardonable: When the biologists of only one long generation ago unrolled the scroll picturing the origin and perpetuation of species through natural interactions, their interpretation seemed too simple to be true; when the anthropologists of the present generation unrolled a similar scroll picturing the origin of activities (arts, industries, laws, languages, doctrines) through natural interactions and self-developed interrelations — and in this way

alone—, their interpretation in turn seemed too simple to be true; and when the anthropologists of the old century's end (and of this Society) unroll a scroll picturing the origin and development of thought itself through the long chain of interactions between the thinking organism and external nature — and in this way alone—, they foresee that their interpretation must seem too simple to be true — though they find comfort in the teachings of experience that in the long run simple explanations are preferred, that simple doctrines at last prevail, indeed that the progress of knowledge is best measured by its own simplification. But even after full allowance for hesitation and doubt, it must still be said that the opening of the post-Huxleian vista has had much effect: It has widened the view of nature to include the psychical as well as the physical aspects of organisms; it has correspondingly narrowed the range of extra-natural explanations of phenomena; and, specifically, it has revealed a new class of homologies among the races of men and between these and sub-human organisms. So the homologies recognized today as defining man's place in nature are of three classes: (1) structural, as wrought out by Huxley; (2) activital, as suggested by Huxley and wrought out by Powell; and (3) mental, or psychic. Expressed otherwise, man's place in nature is now defined, first by what mankind and their kindred *are*, second by what they *do*, and third by what they *think*. And the chief progress of the post-Huxleian epoch, albeit practically confined to *Homo sapiens* in various grades of development, has followed the lines of psychic homologies.

It is just to say that the foundation for modern knowledge of psychic homologies was laid by Tylor in his *Primitive Culture* (1871), and especially in the seven notable chapters on animism elaborated in successive editions; for he showed that a certain type of philosophy is of world-wide extent and is, or has been, shared by every race, every known people, whatsoever their diversities of color or condition. This foundation was gradually raised into a definite platform, partly by Tylor in later publications,

partly by Powell in brief memoirs on *The Mythology of the North American Indians* (1879) and *Activital Similarities* (1881), in which it was shown that the interactions between distinct peoples and similar environments frequently produce similar activities, howsoever diverse the peoples themselves; and important additions to the platform were made by Brinton in various contributions summarized in his *Religions of Primitive Peoples* (1897), in which he showed that the human mind, even in its more complex operations, reflects environment with striking fidelity. True (as recently shown by Boas [1]), the products of interaction between peoples and environments are in some measure inconsistent, and may even at first sight seem contradictory; but, as pointed out on a previous occasion,[2] the incongruities shrink or disappear when the comparisons are confined to peoples in corresponding degrees of cultural development.

The modern platform for the study of psychic homologies may be defined briefly in terms of a few generalizations, which seem to be consistent with the sum of knowledge concerning the psychic attributes of both human and sub-human organisms, viz: (1) the mentality of animals is instinctive rather than ratiocinative, and for each species responds practically alike to like stimuli; (2) the savage mind is shaped largely by instinct, and responds nearly alike to like stimuli; (3) all barbaric minds are measurably similar in their responses to environmental stimuli; (4) civilized minds rise well above instinct, and work in fairly similar ways under like stimuli; and (5) enlightened minds are essentially ratiocinative, largely independent of instinct, and less nearly alike in their responses to external stimuli than those of lower culture. The several generalizations are mutually and significantly harmonious; they combine to outline a course of development beginning in the animal realm with organisms adapted to environment through

[1] "The Mind of Primitive Man," *Science*, vol. XIII, 1901, pp. 281–289.

[2] "Cardinal Principles of Science," *Proceedings of the Washington Academy of Sciences*, vol. II, 1900, p. 11.

physiologic processes, and ending in that realm of enlightened humanity in which mind molds environment through nature-conquest [1]; and they measure the gradual mergence of bestial instinct in the brightening intellect of progressive humanity. To, or at least toward, this platform those working anthropologists concerned with the broader aspects of the science have been pressed by accumulating observations and generalizations; yet the platform owes much of its character and most of its strength to the concurrent development of a scientific psychology at the hands of a notable group of experimentalists in psychic phenomena. The several generalizations embodied in the platform have already been summarized as the latest and most comprehensive among the principles of science, i. e., the responsivity of mind [2]; and by aid of this principle, psychic homologies may be traced between higher culture-grades and lower, and from people to people and tribe to tribe down to the plane of lowest savagery — where the lines cease for lack of data, leaving the lowly mind in a state even more suggestively akin to that of the sub-human organism than is the lowest human skeleton to that of the highest anthropoids.

Especially within the last decade of the old century, anthropologists have come to recognize a course of development of the esthetic arts — a sort of natural history of esthetics, arising in symbolism, running through conventionism, and maturing in a degree of refined realism found satisfying by civilized and enlightened peoples. Now a significant feature of this development is found in the fact that the initial symbolism is zoic or animistic, putatively if not patently: The esthetic hunger of

[1] Cf. "The Seri Indians," *Seventeenth Annual Report of the Bureau of American Ethnology*, 1898, p. 269.

[2] "The cardinal principles of science may be reckoned as five: the indestructibility of matter, the contribution chiefly of Chemistry; the persistence of motion, the gift mainly of Physics; the development of species, the offering of the biotic sciences; the uniformity of nature, the guerdon of Geology and the older sciences; and the responsivity of mind, the joint gift of several sciences, though put in final form by Anthropology."—*Proceedings of the Washington Academy of Sciences*, vol. II, 1900, pp. 11–12.

primitive artists is sated by the carving of totems on trees or rocks, by the molding of animal effigies, perhaps by the delineation and painting of zoic pictographs; as the artists rise in the scale of culture, the zoic designs are partly conventionized (eventually passing into arbitrary alphabets), partly perpetuated in more realistic forms still conceived as fraught with mystical meaning, like the asp of Egyptian sculpture, the dragon of oriental painting, the curiously vestigial unicorn of a modern nation's coat-of-arms, and even the eagles of other national insignia. So, also, when primal man first yields to the charm of music, his songs and accompaniments mimic the rhythmic footfalls of feared or venerated animals, the rustling sounds of animal movements, the inchoate melody of animal voices; when he enters the demesne of drama, his characters are beasts or uncanny monsters tricked out in zoic trappings; and it is only after long stages of development that anthropomorphic motives are introduced, and that the music and drama rise to the plane of realistic representation. In some cases, if not commonly, the germ of esthetic development quickens in painting of face or body, to grow into tattooing; in simplest form the painted devices may serve as beacon-marks for the identification of kindred (like the face-marks of various animals), as among Seri matrons,[1] or may symbolize fearsome animals, as among Sioux warriors; but in every well-known case the motive is symbolic expression of zoic attributes. From these germinal efforts of esthetic faculty to that modern stage of art in which the noblest realism and the highest idealism are wedded, the way is long; but every step is marked by the dropping of zoic motives and the substitution of motives springing from human attributes and aspirations.

Within a few years working anthropologists have come to recognize more or less clearly a natural history of industries, comparable with that of arts — a course of development also arising

[1] The sematic and telic functions of face-painting are discussed in "The Seri Indians," op. cit., p. 167 et seq.

in symbolism, running through instinct-guided conventionism, and maturing in that sublimest product of mentality, invention. It has long been known that barbaric artisans seek omens among birds, borrow lore from beasts, and run to zoic motives in decoration [1]; it has long been known, too, that savage huntsmen not only imitate the movements of feral animals in the chase and seek to incite their weapons and strengthen their arms by zoic trophies, but even mimic the feral carnivores' blood-craze in fierce berserker rage at times of battle; and more recently it has been noted that the most primitive implements are of tooth, claw, shell, and bone, selected and used as emblems of zoic power. In a typical tribe — the Seri, most primitive of known Amerinds — the pristine implement is a sea-lion tooth, differentiated into arrow, harpoon, and firestick; the teeth themselves are classed as stones, and natural pebbles are used for tools emblematic of the zoic organs; while the methods of chase and warfare still mimic the habits of local beasts. The lines of human progress from primal savagery to enlightenment may be traced in terms of development of each or all of the great groups of activities; and while all the tracings conform so closely as to inspire confidence in each, no outline is more definite than that represented by the stages of industrial progress — stages best defined in terms of the mind-led activities of which artifacts are normal products. These stages (beginning with that typified by the Seri) are (1) Zoömimic, in which bestial organs are used as arrows and other implements, to which magical powers are imputed by dominating zoötheistic faith; (2) Protolithic, in which naturally-formed stones are used for cleavers and other implements, under the sway of mystical faith modified by experience of mechanical chance; (3) Technolithic, in which design-shaped stones are used for knives and other implements in ways revealing the germ of invention; and (4) Metallurgic, in which ores are smelted and used for tools under

[1] Even the faith-guided anti-zoic motive of arabesque decoration attests the force of the zoic tendency and the effort required to divert it.

the influence of invention.[1] Whether the progress be traced through these stages or otherwise, the way from the simple industries of the prime to the elaborate devices of modernity is long, very long; yet a full half of the steps are marked by the dropping of zoic motives and the substitution of motives expressing man's growing consciousness of power in nature-conquest.

Since Tylor traced primitive culture, and especially since Morgan wrote on *Ancient Society* (1877), it has been recognized that all known primitive peoples are banded in consanguineal groups, while advanced peoples are bound in larger groups by laws defining proprietary and personal rights; and during the last decade or two working anthropologists have come to recognize the course of development of social organization in its several stages — i. e., the natural history of laws. Now it is significant that the most primitive social bond (found alike in America, Africa, Australia, and parts of Asia) is that fixed by the ocular blood-kinship of maternity, and that the next great stage is defined by paternal relationship; for in both stages the lines seem to be homologous with the instinctive habits of sub-human species, while the earlier the more closely approaches the low plane of brute knowledge — so far as this can be inferred from brute conduct. The researches among the aborigines of America have thrown strong light on the lowly laws of primitive peoples; for it has been ascertained that both savage clans and barbaric gentes are bound not merely by community of blood but welded into homogeneous units by community of faith in zoic tutelaries — faith so profound, so blent with fear and hope, so impressed by recurrent ceremony from birth to maturity and thence to old age and death, as to dominate every thought and regulate every action. The Amerind tribesmen are grouped by totems (or tutelaries) of Wolf, Badger, Bear, Fox, Deer, Coyote, Eagle, Bluejay, etc.; they call themselves Wolves, or Badgers, or Bears, or Eagles, and glory in the strength

[1] The stages and transitional sub-stages are set forth in greater detail in "The Seri Indians," op. cit., pp. 249–254.

and magical prestige believed to be brought them by their genii; most of them recite traditions of descent from the tutelary animals, or else from fantastic monsters invested with their attributes; and every adequately studied tribe has been found to possess a traditional genesis or sacred cosmogony in which the tutelaries, and perhaps other beasts, are glorified if not deified. The exoteric bond of clan or gens is blood-kinship; but the union is reinforced by an incomparably stronger esoteric bond of animistic belief. The way from beast-clanship to free citizenship is long — so long as to afford the most striking measure of human progress; yet every step of the way is marked by the elimination of zoic concepts and by the substitution of humane concepts forced on the genus *Homo* in his ceaseless strife for nature-conquest.

During some decades past, students of aboriginal tongues have been impressed by the failure of primitive folk to discriminate clearly between men and animals in their everyday speech; and this lowly habit forms one of the phenomena which have served (as recently shown by Powell)[1] as a clue to the natural history of languages. Many Amerind tribes denote themselves by a term connoting animals, either in general or of a particular class, and when pressed to specify are compelled to employ an affix or adjective to distinguish the human kind (often considered inferior) from the rest; some, like the Papago, trace human genealogy through only a few generations forward or backward, and conceive the lines as beginning and ending in an undifferentiated magma of zoic life designated by a single term; while some groups have progressed so far in the way of human superiority as to dignify themselves by the expressions "Real Men," "True Men," etc., in contradistinction from alien tribes and other contemptible creatures. The scroll picturing the development of language is expanded about midlength by the addition of the scriptorial branch, representing the growth

[1] "Philology, or the Science of Activities Designed for Expression," *American Anthropologist*, vol. II, 1900, pp. 603–637.

of graphic expression; and it is quite in accord with the growth-lines of oral expression to find that the earliest essays in ideography are pictures of zoic objects, or objects to which zoic attributes were manifestly imputed. Most of the primal features of modern alphabets have been conventionized beyond recognition; but the hieroglyphs of Mexico and Egypt and the ideographs of China are among the clearer vestiges of primitive standards, while the fancy-wrought constellations of the celestial sphere—birth-mates of pre-Cadmean characters remaining unchanged by reason of remoteness from practical affairs—still conserve the graphic zoölatry in which writing began. The way from lowly language linking men and beasts in word and sign to a discrete graphic vocabulary is long; yet the earlier steps were unquestionably marked by the dropping of instincts shared by brutes and the substitution of humanitarian concepts impressed by ever-widening human associations.

Since Tylor taught the world-wide range of animism in 1871, anthropologists have grouped the myths and faiths of mankind in a series of stages outlining a course of development — a natural history of doctrine — coming up through a slavish and despairing hylozoism, and ascending thence through higher zoötheism and broadening worship of nature-powers on successive planes, each brighter and more humane than the last. The zoic factors of primitive arts, industries, laws, and languages were manifestly made potent in the olden time, as they are today among lowly folk, alike by overweening faith and ever-present custom; they were, and still are, kept alive not only by recurrent ceremony and daily taboo and hourly precept, but by tireless study of animal contemporaries whose habits huntsmen must know under pain of hunger; so that much (perhaps most) of the sentient feeling of primal man must have been — as it is today among his survivors — of animal contemporaries. In savage life men and their animal associates are compelled to consecrate their best efforts to study of each other; in affairs of feeling and faith as in matters of

immediate utility, the association engenders habits of body maturing in instincts eventually ripening into action-shaping habits of mind; and the stronger mentality is naturally the more deeply influenced — until continued experience of superior faculty awakens consciousness of superior power, stirs the sleeping giant of self-confidence, and rends the shackles of zoöphobia forever.

> Lo, the poor Indian! whose untutored mind
> Sees *Beasts* in clouds, or hears *them* in the wind;

so a modern Pope would write of the American natives; and so, too, he might write of any and all other aborigines made known through the researches of the last half-century. The upward way from primal beast-faith through concurrent fetichism and shamanism and thence through mysticism and all manner of occultism is long and need not now be traced; it suffices that all of the earlier and many of the later steps were marked by the dropping of zoic motives or vestiges and the substitution of ever nobler motives and imageries.

When the scrolls picturing activital development are brought together—when the natural history of doctrines is outlined over those of languages, laws, industries, and arts—the leading lines are found consistent in every essential feature; and all are seen to rise from a mentality both reflecting and approaching that of lower animals (though just how closely may not be measured until the sub-human mind is better understood) toward the highest human plane revealed in science and statecraft. The savage Seri —lowest of American tribesmen—is loathed by Caucasian neighbors as an uncanny beast, and it is a revelation to find that he reciprocates the loathing and glories in the contumely, feeling that it allies him the more closely with venerated consociates like puma and shark, and divides him the more widely from the hated white creatures of unnatural ways; and the sentiment of the Seri is measurably common to all aborigines of strong individuality. The impressive fact, learned alike through observation of a typical tribe and through analysis of the mental operations of primitive

peoples in general, is that the savage stands strikingly close to sub-human species in every aspect of mentality as well as in bodily habits and bodily structure.

Since Huxley's prime, the chief advances in anthropology have related to what men *do* and what men *think;* and the progress has been such as to indicate with fairly satisfactory clearness the natural history of human thinking as well as that of human doing. Thereby man's place in nature may be defined more trenchantly than was possible in 1871: (1) As shown by Huxley, the structure of *Homo sapiens* is homologous with that of lower orders, while the morphologic differences between highest anthropoids and lowest men are less than those separating lowest men from highest men; (2) as suggested by Huxley and established by later researches, the activities of *Homo sapiens* are homologous with those of the anthropoids, while the activital range between club-using gorilla and tooth-using savage is far narrower than that separating the zoömimic savage from the engine-using inventor; (3) as shown by the latest researches, the mental workings of *Homo sapiens* are homologous with those of lower animals, while the range from the instinct and budding reason of higher animals to the thinking of lowest man seems far less than that separating the beast-fearing savage from the scientist or statesman. The resemblances and differences in doing and thinking may not yet be measured in definite units, as are cranial capacities and facial angles (though the recent progress in experimental psychology gives promise of quantitative determinations of general sort at no distant day); yet the relations are hardly less clear and tangible than those customarily measured in inches and ounces and degrees.

So in the light of the latest researches man must be placed wholly within the domain of nature, yet above all other organisms at heights varying widely with that highest product and expression of nature, mental power.

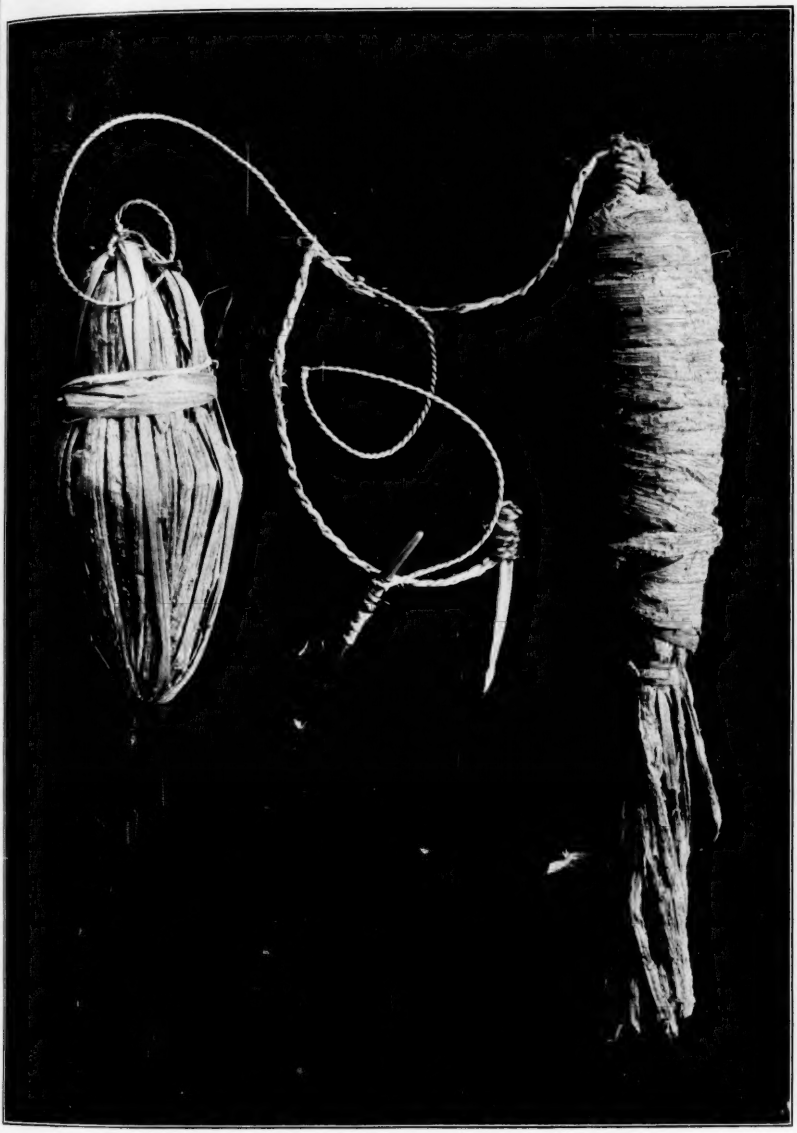
CERTAIN GAMBLING GAMES OF THE KLAMATH INDIANS

By GEORGE A. DORSEY

During the month of June, 1900, it was my good fortune to spend a week among the Klamath Indians of Upper Klamath lake, Oregon, the object of my visit being to obtain ethnological collections for the Department of Anthropology of the Field Columbian Museum. In this I succeeded far beyond expectations, for, although the Klamath are reached only after a long and tiresome stage journey of 120 miles, and hence are rather free from the visits of collectors, they early in their association with the Indian Bureau willingly and even eagerly decided to adopt the manners and customs of the white man, consequently, to a very large extent and from many points of view, they have ceased to be a subject of general interest to the anthropologist. But so tenacious a hold has the primitive life upon the Indian that there still survives much that is of value and real importance to the student. Naturally I had access to Gatschet's scholarly work on the language of the Klamath,[1] and in many ways it proved of great assistance; but the importance of making a full and complete ethnologic collection in connection with a work of this nature was many times proved, for of the 250-odd specimens which I collected not more than three-fourths are mentioned in Gatschet's dictionary.

Among the categories of objects collected by me among the Klamath, none is more complete or interesting than that of games, of which not fewer than ten varieties were procured. With most of these satisfactory data were gathered; with one or

[1] A. S. Gatschet: "The Klamath Indians of Southwestern Oregon"; *Contributions to North American Ethnology*, vol. II, Washington, 1890.



KLAMATH BALL AND PIN GAMES

(Cat. Nos. 61673, 61712, Field Columbian Museum. Natural size)

two I had difficulty in obtaining such information as was desired, but this must be attributed to the nature and briefness of my visit. Not so much on account of the number of games collected as on account of the very peculiar geographical position of the Klamath have I thought a brief account of these games to be of sufficient importance to merit publication. The almost unique geographic position of the Klamath may best be comprehended by a glance at Powell's Map of the Linguistic Stocks of North America.[1] This map shows them to be near neighbors of not fewer than twelve different stocks, among which may be noted families of such importance as the Shoshonean, Shahaptian, and Athapascan. With such neighbors, so diversified in their origin and culture, it will be more than surprising if we do not find the Klamath games full of interest; and above all we may reasonably expect a wide variety of forms, for it seems probable that no phase of American aboriginal life was so subject to adoption by other tribes as gaming devices.

In considering the order in which the Klamath games should be treated, I have thought it better to follow a classification based on the character or nature of the games themselves than to treat first of the games played by the men, following with those of the women. It is now a well-known fact that, owing chiefly to the investigations of Mr Culin, the sixty or more varieties of games found in North America may be resolved into not more than five general divisions, the games in each being more or less intimately related and all perhaps having had a common origin.

I. As an example of the first category, the Arapaho wheel-and-arrow game may be cited. In this class of games a spear is hurled or an arrow is shot at something, generally a ring. Success in these games depends primarily on the ability to shoot or hurl a missile so that it may strike in some particular spot or that it will come to a full stop at some point in contact with a special portion of the ring.

[1] *Seventh Annual Report* of the Bureau of Ethnology.

II. Somewhat similar to games of the first division, those of the second also require the ability of the player to take good aim, but the object in this case is directly struck, as a ball by means of a stick. Strength and (to a greater extent) agility are also required, for the ball must be driven to a certain point in opposition to the efforts of an opponent, or certain positions of the ball must be maintained for a length of time greater than is possible with the adversary. Such are the game of shinny, so common among the Plains Indians, and the game of football or kicked stick among the Pueblo tribes.

III. In the third category of games success depends rather on skill acquired by long and patient practice, the object being to catch some such object as a cup-shaped bone, or a fish vertebra, or a ball, upon the point of a bodkin or needle. The so-called matrimonial game of the central and eastern Indians is the best-known example.

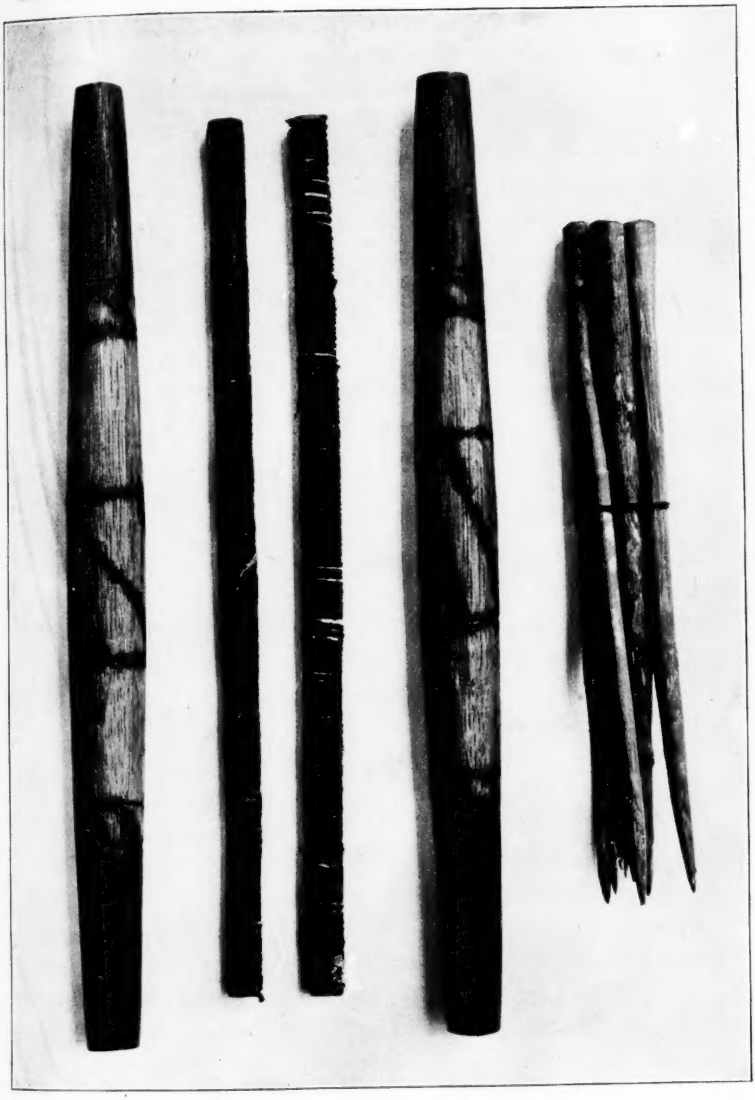
IV. In this category success is dependent solely on judgment, the object being to guess the location of an object, or of one object from two or more which have been concealed. Good examples are the moccasin game and the hand or grass game.

V. In the fifth class of games, objects are thrown on the ground or are permitted to fall in a basket or bowl, and the count is determined by the chance of the throw, one side or the other of the objects having a certain value, either singly or in combinations; such are the well-known stave and dice games.

The order in which these five categories of games has been given is based merely on the personal convenience of the writer. That this order suggests any line of development is not believed; on the contrary, it is extremely likely that the games of the second division represent the oldest of American games.

I.—RING AND JAVELIN GAMES

The games of this class, nine specimens of which were collected, represent five distinct variations.



KLAMATH FOUR-STICK GAME AND COUNTERS

(Cat. No. 61537, Field Columbian Museum. Three-fourths natural size)

WÓSHAKANK.—This is a ring-and-arrow game, the arrows employed not differing from those used by boys in hunting. The ring (61682)[1] measures 11 inches in diameter and is made of the inner fiber of the tule rush, wrapped with tule bark. The object of the game is to hit the ring with an arrow.

Another specimen of ring (61681) belonging to this game is 6 inches in diameter. Rings of this size are used chiefly by boys. In construction it does not differ from the ring just described, except that half of the outer wrapping is of tule.

SHÜ'KSHUKS.—This game is generally similar to the one just described. It is usually played in a wikiup by either men or boys, and most commonly in winter, in the following manner: One of two boys, sitting from eight to ten feet apart, rolls a ring toward the other who shoots at it with an arrow (*ntê'kish*). In case he hits the ring, the one who rolled it endeavors, by shooting, to dislodge the arrow therefrom. Should the latter succeed, there is no count; otherwise the one who first shot gains an arrow, the object of the game being to win arrows. In the set collected (61641), there are a small bow, 2 feet in length, and three small reed arrows with long sharp wooden points of sage. The rings belonging to the set measure 3 and 4 inches in diameter, respectively, and are made of a variety of flexible bast.

Another ring (61530) belonging to this game measures 4 inches in diameter; it is made of tule fiber loosely wrapped with straw-like rush.

SHÜ'KSHUKS.—Although this game bears the same name as the one last described, the manner of playing is somewhat different. The ring (*shü'kshuks*) measures half an inch in diameter (figure 1), is rather tightly woven, and is not so flexible as the rings above described. Instead of an arrow, a small awl-like object is used, consisting of a bone point mounted in a sharp wooden handle. This variety of the ring game is played by both sexes and by all ages, and generally in the wikiup. The players

[1] Numbers refer to specimens in the Field Columbian Museum.

sit facing each other, and as one rolls the ring in front of him his opponent attempts to pierce one or both sides of the ring with the point of his awl. To pierce one side counts one, both sides two. Two specimens (61716–17) of this game were collected.

SHÜ'KSHUKS.—This is an interesting variation of the ring game for which I could get no native name to distinguish it from the ones just described; nor do I know that an account of this

FIG. 1—Ring and awl for game. (Cat. No. *61717*, Field Columbian Museum. Natural size.)

game has ever been published. The ring (figure 2) measures 11 inches in diameter and is an inch thick. Across one side of it is fastened a cross-bar, measuring 17 inches in length, projecting three inches beyond the ring on each side. Both ring and cross-bar are made of the inner fiber of the tule rush, closely wrapped with tule bark, the inner surface being placed outside, giving the ring a whitish color. In playing the game two rings of equal size are used; these are placed in an upright position, one end of the cross-bar resting on a sharp wooden pin firmly fixed in the ground. The interval between the two goals varies according to agreement between the players. There are always two opposing sides, each

FIG. 2—Tule fiber ring for game. (Cat. No. *61674*, Field Columbian Museum. ⅛ natural size.)

consisting of one or more individuals. The ring is shot at with arrows from a bow, the object being to pierce both sides of the goal, which is always placed at right angles. Two specimens (61622, 61674) of this game were collected, the only difference being in the size of the diameter of the ring and the length of the cross-bar. This game, I was informed, has not been played for many years, and satisfactory information concerning the method of playing could not be obtained.

SHÍKNA.—This interesting variation of the ring game is played only by men. It consists of as many spears (*shíkna*) as there are individual players, and two goals (*tchedalk*), each of which is simply a forked stick thrust into the ground at such interval as may be mutually agreed on. The spears are of willow, measuring 6 feet in length and sharpened at one end. They are decorticated, except at the lower extremity. The spears are hurled from the hand, the object being to cause them to fall in such manner that the end of the spear will rest on the fork of the goal. Such a throw counts five, otherwise the one whose spear falls nearest the goal counts one; ten usually constitutes the game. The game is still practised to some extent by the Klamath, and in playing they exhibit great skill, one of the players whom I saw not failing to strike the goal oftener than once in six or eight throws. One set of this game (61710) consists of two spears and a pair of forked sticks.

II.—BALL GAMES

Of games of this variety two sets were collected, one of which is not without considerable interest:

TCHÍMMAASH.—This game (61538) is generally played by women. Two goals (*ánku*) are marked about a hundred yards apart. Each player is armed with a short willow pole (*skuékûsh*) with which she attempts to drive before her, in the direction of her opponent's goal, two wooden billets, 6 inches long and an inch in diameter, fastened to each other by means of a stout cord, 10 inches in length, which passes through the center of each

billet (figure 3). From two to ten generally play. The set of two poles (61538) collected by me are of willow; they are decorticated and marked throughout the greater part of their length with two burnt spiral bands which run in opposite directions. This game has been described by Gatschet[1] as follows:

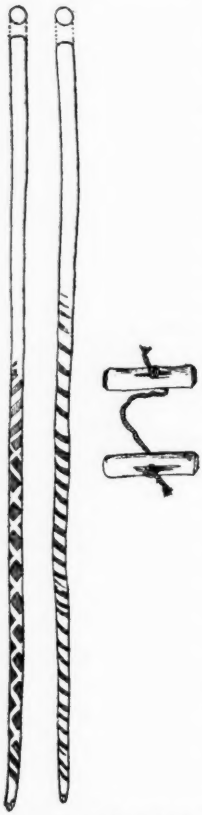


FIG. 3—Poles and double ball for game. (Cat. No. 61538. $\frac{1}{10}$ natural size.)

> In playing *tchímmaash*, the Klamath women run back and forth, every one holding willow poles. In the middle of the starting places on either side they plant sticks for fixing bases, then with their poles they throw up the game string. Having caught it they throw it to the others, then they run over there; they throw the game string while chasing each other. One party throws back the poles to the girls on their side; and they then chase each other to the bases.

SHINNY.—For some reason, which I can not now explain, I failed to get the Indian name of this game. The set collected (61726) consists of a bat of white pine terminating in a flat extended portion, and a ball $2\frac{1}{2}$ inches in length, of the same material. There is nothing in the Klamath method of playing this game which calls for special comment.

HESHTALXEASH.—The invariable answer to repeated inquiries among the old men was to the effect that the Klamath possessed tops before the advent of the whites. The first specimen (61729) has a disk, $2\frac{1}{2}$ inches in diameter, made of white-pine bark, through which is thrust a 4-inch stick sharpened at each end, thus giving the form of an ordinary spinning top.

[1] Gatschet, loc. cit., part 1, p. 80. This and following quotations from Gatschet are literal translations of native texts.

The second specimen collected (61728) is similar to the first except that the disk is of cedar bark and instead of being beveled at the edges is cut off squarely.

III.—BALL AND PIN GAMES (PLATE II)

A number of specimens of a single variety of a game of this category which were collected are unusually interesting and, so far as I know, have not previously been noted as existing in this region.

SOQUOQUAS.—This specimen (61531) consists of a long elliptical ball made of tule pith. The lower end of the ball, which remains loose, consists of a dozen or more strings of tule fiber which project beyond the ball. The upper portion or body of the ball is tightly wrapped with the outer bark of the tule rush. Projecting from the upper end of the ball is a small braided loop, a quarter of an inch in diameter, to which is fastened a 6-inch thread of native grass. At the end of this thread is attached a small bone pin a little more than an inch in length. The game is played as follows: Taking the pin by the end to which the cord is attached between the thumb and forefinger, and permitting the ball to hang loosely at the end of the string, a sudden downward thrust is given, the object being to strike the braided loop and catch it on the point of the pin. This is known as *shapashspatcha* ("to split or punch out the moon"). The game is always played in winter and generally only by adults. It is believed that by "punching out the moon" in this fashion the winter months are shortened and the advent of spring is hastened.

Another example (61673) is made similarly to the specimen just described; the ball, however, is 5 inches in length, while from it project several strands of the inner fiber of tule, also 5 inches in length; the knot, string, and pin are somewhat larger.

In another specimen (61532) no strands of fiber project from the ball, the two ends being similarly finished. Instead of the string being tied in a loop at the upper end, it is simply

fastened in one of the wrappings. This ball is not wound from side to side with a circular wrapping of tule bark, but it is wrapped about the center from eight to ten times with a tightly woven thread of that material.

The three other specimens (61712,–13,–15) are much smaller than the specimens described, the largest not being over 2½ inches in length. They are all made of the bark of tule, which has been tightly wrapped from end to end, being considerably larger about the middle than at either end, thus giving the ball a sort of lozenge shape. In each of these three specimens the thread connecting the pin and the ball is unusually well made and is very soft and pliable, while the pin consists simply of a porcupine quill. In all those specimens in which no loop projects from the ball to which the string is attached, the object of the game is to strike the knot where the string is fastened to the ball.

IV.—GUESSING GAMES

As might be expected, we find the well-known hand game played among the Klamath, and in addition the four-stick game, in its most interesting form, is found.

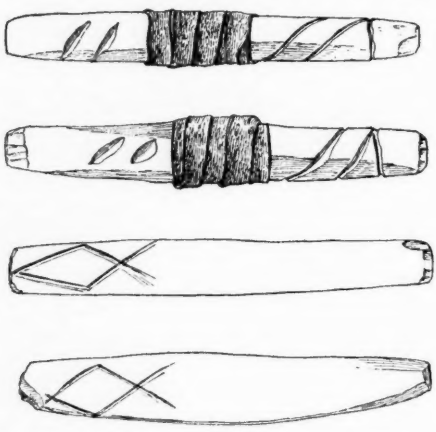


FIG. 4—Bones for hand game. (Cat. No. *61616*. ⅓ natural size.)

LÓIPAS.—The single set of hand game (61616) collected consists of four solid bones 3 inches in length and tapering toward each end. Two of the bones (figure 4) have wound about their center several wrappings of a buckskin thong; all of them are decorated, the two plain ones having on one side of one end a double cross

(××), while the marked bones have at one end an incision, running around the bone, from which spring two parallel incised spirals terminating under the wrappings. The two marked bones are known as *skútash* (tied around) or *híshuaksh* (male), while the unmarked bones are *solsas* (female). With this set are twelve sticks, 8 inches in length and sharpened at one end, which serve as counters (*kshesh*) for the hand game.

In connection with this hand game there should be mentioned a lozenge-shape stone (figure 5) measuring 2¼ inches long by 1½ in breadth and an inch in thickness. This stone, with several others similar in shape, was found at Klamath falls, near the foot of Klamath lake, and was obtained by me from a merchant as I was leaving the reservation. The person from whom I procured the specimen said that a number of Klamath Indians had seen the stone and had unanimously declared that it was formerly used in playing the hand game. It was not possible for me to verify this statement, but from the shape of the stone and from my inability to see to what other use it could have been put, I am inclined to the belief that it has been used in the hand game.

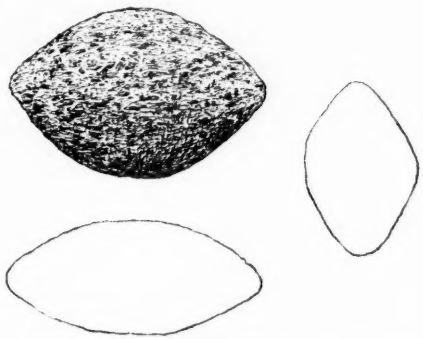


FIG. 5—Stone used in hand game (?). (Cat. No. *61772*. ⅔ natural size.)

SHULSHÉSHLA, SPÉLSHNA, or SHÁKLA.—This game (61537) consists of four hardwood sticks (plate III) 12 inches in length. Two of the sticks (*skú'tash*) are less than half an inch in diameter and are closely covered with wrappings extending from end to end of a buckskin thong which has been painted black; the other two sticks (*mû'měni*, or *solses*) are half an inch in diameter at the ends

and an inch at the center, and the extremities have been blackened by being charred with a hot iron. Toward the center of these two sticks are two bands, two inches apart, which have been burnt in. Connecting the two bands are four parallel spirals also made by burning. There are also six small sticks, 8 inches in length, sharpened at one end and painted red; these are counters (*kshesh*) which, at the beginning of the game, are in possession of one or the other side and lie flat on the ground. As points are won by one or the other side, they are taken up and thrust into the ground in front of the winner according to the number of points gained. In playing this game the four long sticks are arranged in one of a number of possible combinations, the player hiding them under a blanket or large basket tray. *A* taking the counters on his side makes the first guess, *B* manipulating the sticks under a blanket or mat. Should *A* guess correctly the position of the sticks, he wins and thrusts in the ground one or two counters according to the value of his guess, and *B* again arranges the sticks under the blanket. Should *A* guess wrongly he forfeits one counter and guesses again, but in this case *B* conceals only two of the sticks, that is, one large and one small wrapped one. If *A* wins, or guesses correctly, the sticks are passed to him, when he manipulates them under the blanket and *B* guesses. But if *A* loses, he forfeits a counter and *B* again manipulates the single pair of sticks. In guessing, when they wish to designate the small wrapped sticks, the index and middle fingers are used; for the thick sticks, the index finger alone. In expressing the guess at positions numbered 1 (figure 6) and 2 (*vuish*) they

FIG. 6—Possible combinations of large and small sticks.

move the hand sideways one way or another as they desire to indicate the positions as expressed in numbers 1 or 2. To miss the guess when "*vuish* is laid" neither side loses nor wins, nor is there

any changing to the other opponent of the sticks; but when the position 3 or 4 is laid, with *A* guessing and winning, the sticks must be passed to him for manipulation and he wins no counters. When the sticks are laid in position 5 or 6 and *A* guesses, using two fingers, he obviously loses doubly and two counters are passed to *B*.

Another set (61724) of this game which was collected is exactly similar to the one just described, except that the buckskin-wrapped sticks are not painted black, while the two large sticks are not painted alike, one having two burnt bands about the center two inches apart, from each side of which a row of zigzag lines extends entirely about the stick. On both of the large sticks of this set there are four parallel bands, equidistant from the burnt ends of the stick, the two pairs being connected by parallel spirals.

A third set (61723) collected has two small sticks wrapped with rawhide which has been painted red; the large sticks are charred at each end for an extent of about an inch, while in the center are two parallel black bands. The intervening portions of these two sticks are painted red. This game has been described by Gatschet[1] as follows:

> They play the stick game with four sticks; there are two thick, also two slender skin covered sticks. They guess at the slender sticks with index and middle finger, at the thick ones however with the index finger; they guess at the *vuish* moving the hand sideways; they also guess with the thumb making a side move. By the *vuish* they can only win one counting stick; with the index and middle finger they win two counting sticks, having put forward the index finger. When they have won all stakes from the losers then they stop.

V.—STAVE AND DICE GAMES

In this category of games two well-known varieties were collected, the stave game and the woodchuck-teeth dice.

SKUSHASH.—One set (61711) of this game which was collected

[1] Gatschet, loc. cit., p. 79.

consists of four pine staves (figure 7), $7\frac{3}{4}$ inches long, flat on one side, rather rounded on the other, and tapering toward the ends. Two of the staves are marked by a series of nine parallel lines at

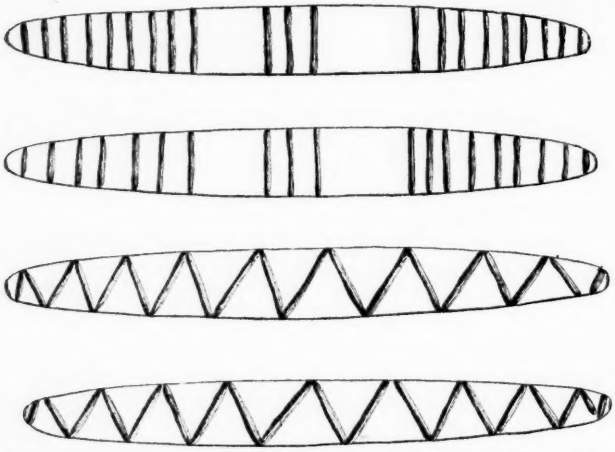


FIG. 7—Set of staves for game. (Cat. No. *61711*, Field Columbian Museum, $\frac{1}{4}$ natural size.)

each end and three parallel lines in the center. These are known as *shnawedsh*, or women; the remaining two sticks are marked from end to end by zigzag lines crossing back and forth from side to side; these are called *xoxsha* or *hishuaksk* (male person). All of these lines have been burnt in by means of a sharp-pointed, heated iron tool. The counting is as follows: All marked sides up or down count two; both male sticks up with women down, or vice versa, count one. These are the only counts.

Set No. 61722 differs from the preceding only in the number of parallel lines in the two *shnawedsh* staves. At the ends of the two staves there are seven parallel lines, while in the center of one are five and of the other six parallel lines.

SKUSHASH.—Although this game is played with woodchuck teeth (figure 8) instead of staves, it bears the same name as the stave game. The two upper teeth (set 61536) are marked flatwise with zigzag lines extending throughout the length of the

tooth; these are *lakí* (male) dice. The lower teeth are marked by four incised dots and are *kúlu* (female). In playing the game, which is generally done only by women, the teeth are dropped on a hard level object, such as an under grinding stone. The count is the same as in the stave game, namely, all marked dice up or down, two; both males up with females down, one.

In another set (61734) the markings are as in the preceding set, except that the lower teeth have five dots instead of four, and that the incised markings on all the four teeth have been filled with red paint instead of black as in the preceding set. This game has also been described by Gatschet,[1] as follows:

FIG. 8—Set of woodchuck-teeth dice. (Cat. No. *61734*. ⅔ natural size.)

The Klamath Lake females play a game with beavers' teeth, letting them drop on a rubbing stone. All teeth having fallen up side, where they are marked, they win two checks. If both female teeth come down falling right side up, they win one check. If both male teeth come down falling right side up, on that account also they gain one check. Falling unequally, however, they win nothing; and having won all the stakes from each other they quit. Only women play this game.

[1] Gatschet, loc. cit., p. 80.

LABORATORY OUTLINES FOR USE IN AN INTRODUCTORY COURSE IN SOMATOLOGY

By FRANK RUSSELL

At Harvard University two classes of students take courses in Somatology: those who are preparing for the profession of medicine and those who are fitting for professional work in Anthropology. The choice of the former is sanctioned by Topinard in these words: "The knowledge of Anthropology adds to medicine a certain superiority, it adds interest to the study of anatomy and physiology; it is the crown of the school of life." The other class acquire knowledge that is essential, in my opinion, to the anthropologist, whatever special division of the science he may enter.

These outlines are published in the hope that they may prove useful to students of Somatology who have not had, heretofore, such a guide. The prominence given to osteology is due in part to the limitations of a recently established laboratory and in part to the abundance of such material at hand. It is to be understood that other sections of the science of Somatology are presented in this general introductory course by means of lectures illustrated by charts, etc.

OSTEOLOGY

A.—Racial and Sexual Type

Study the series of Caucasian and Amerindian bones to determine the average size and form for each of the two races. Compare with the skeletons of other races as far as possible.

Determine the mean for each SEX separately and compare one with another. If DISEASED BONES are found, study their condition: osteoporosis, exostosis, ostitis.

In the study of PAIRED BONES compare right with left.

THE APPENDICULAR SKELETON

a. CLAVICLE:

Measure its length[1]; identify the deltoid tubercle; trapezoid line; subclavian groove; rhomboid impression; conoid tubercle.

b. SCAPULA:

1. Length.
2. Length to base of spine.
3. Breadth.
4. Vertical diameter of glenoid fossa.
5. Transverse diameter of glenoid fossa.
6. Scapular index.
7. Infraspinous index.

Identify the acromion; coracoid process; supra-scapular notch; spine.

c. HUMERUS:

1. Maximum length.
2. Maximum diameter of head.
3. Antero-posterior diameter at deltoid eminence.
4. Transverse diameter at deltoid eminence.
5. Index of shaft at deltoid eminence.
6. Maximum transverse diameter of condyles.
7. Angle of shaft from vertical.
8. Angle of neck and shaft.
9. Angle of torsion. Compare with that of quadrupeds.
10. Relation to stature taken as 100.

Identify tuberosities; pectoral ridge; deltoid eminence; coronoid, radial, and olecranon fossæ; trochlea; capitellum; spiral groove; supratrochlear and entepicondylar foramina.

[1] Fractions less than .5 of a millimeter may be disregarded; when above .5 the next higher whole number should be written. Whenever the series of measurements is sufficiently large, determine the *mean magnitude* instead of the average.

d. RADIUS:

1. Length.
2. Circumference at middle of shaft.
3. Perimetral index.
4. Humero-radial index, radius × 100 ÷ humerus.
5. Relation to stature taken as 100.
6. Relation of radius plus humerus to stature taken as 100.

Identify the tuberosity; oblique lines; sigmoid cavity; styloid process; tubercle.

e. FEMUR:

1. Length.
2. Length to great trochanter.
3. Oblique length.
4. Oblique length to great trochanter.
5. Maximum diameter of head.
6. Length of neck and head.
7. Index of *branche oblique*.
8. Height of neck at middle.
9. Antero-posterior diameter of neck.
10. Index of neck.
11. Antero-posterior diameter at subtrochanteric region.
12. Transverse diameter.
13. Platymeric index.
14. Degree of curvature.
15. Antero-posterior diameter at middle of shaft.
16. Transverse diameter at middle of shaft.
17. Pilastric index.
18. Popliteal transverse diameter.
19. Diameter Mn.
20. Diameter Mp.
21. Popliteal index.
22. Transverse diameter of condyles.
23. Condylar index.
24. Antero-posterior diameter of external condyle.

25. Angle of neck and shaft.
26. Angle of shaft from the vertical.
27. Angular index.
28. Angle of torsion.
29. Relation to stature taken as 100.

Identify the bicipital fossa; great, small, and third trochanters; tubercles of the quadratus and of the femur; intertrochanteric, spiral, and pectineal lines; gluteal ridge; linea aspera; popliteal surface; supracondylar ridges; tuberosities; intercondylar notch. Study the lamellæ in a transverse longitudinal section; pilastered femur; fossa hypotrochanterica.

Effects of dampness.—Measure a femur with the greatest care, then soak it in water for eight days and measure again to determine the amount of increase in volume.

f. TIBIA:

1. Length.
2. Transverse diameter of condyles.
3. Curve of external condyle.
4. Antero-posterior diameter at middle of shaft.
5. Transverse diameter.
6. Index of shaft.
7. Minimum circumference of shaft.
8. Perimetral index.
9. Angle of torsion.
10. Tibio-femoral index, length of tibia $\times$ 100 $\div$ length of femur.
11. Intermembral index, length of humerus $+$ radius $\times$ 100 $\div$ the length of femur $+$ tibia.
12. Relation to stature taken as 100.
13. Relation of tibia plus femur to stature taken as 100.

Identify the spine; popliteal notch; tuberosities; tubercle; oblique line; crest; internal malleolus. Note the significance and racial distribution of the curved external condyle and astragalo-tibial articulation.

Euknemia,
Subplatycnemia,
Platycnemia,
Retroversion.

Determine the stature from each of the long bones by the mathematical method.

Compare the methods of Rollet, Manouvrier, Topinard, and Dwight.

g. PELVIS:[1]

1. Breadth.
2. Height, summit of ilium to most depending part of ischium.
3. Breadth-height index, height × 100 ÷ breadth.
4. Breadth between the anterior superior iliac spines.
5. Breadth between the posterior superior iliac spines.
6. Breadth between ischial tuberosities, outer borders.
7. Breadth between ischial spines, tips.
8. Maximum diameter of obturator foramen.
9. Vertical diameter of obturator foramen.
10. Transverse diameter of obturator foramen.
11. Obturator index, transverse diameter × 100 ÷ vertical diameter.
12. Subpubic angle.

Dimensions of true Pelvis

13. Transverse diameter, between the ilio-pectineal lines.
14. Conjugate diameter, promontory to body of os pubis near the symphysis.
15. Pelvic index, conjugate diameter × 100 ÷ transverse diameter.
16. Oblique diameter, right and left, sacro-iliac joint to ilio-pectineal line, internal to the pectineal eminence.

[1] These measurements are taken from the article by Sir William Turner, "Report on the Bones of the Human Skeleton," in the *Challenger Reports*, vol. XVI, part iv, p. 6.

17. Inferior sagittal diameter, from the middle of the anterior inferior border of the body of the fifth sacral vertebra and the lower border of the pubic symphysis.
18. Coccygeo-pubic diameter, tip of coccyx ⟩ lower border of symphysis.
19. Intertuberal diameter, inner borders below sciatic notch.
20. Depth of pubic symphysis.
21. Depth of pelvic cavity, from brim near pectineal eminence to most depending portion of the tuber ischii.

Dimensions of Individual Bones

22. Height-length of ilium, angle at bottom of acetabulum to summit of crest.
23. Breadth of ilium, between superior spines: anterior and posterior.
24. Iliac index, breadth × 100 ÷ height-length.
25. Breadth of innominate bone, posterior superior iliac spine to pubic symphysis.
26. Length of os pubis, angle in acetabulum to the pubic symphysis.
27. Pubo-innominate index, pubic length × 100 ÷ innominate breadth.
28. Length of ischium, angle in acetabulum to most depending part of the tuber ischii.
29. Innominate index, breadth × 100 ÷ height-length.
30. Ischio-innominate index, ischial length × 100 ÷ pelvic height.
31. Length of coccyx.
32. Breadth of coccyx.

Define the limits of the ilium, sacrum, os pubis, and os acetabulum in the os innominatum; epiphyses; position of the pelvis in the course of ontogenetic development; true and false pelvis; spines; crests; foramina; notches; symphysis; tuberosity;

illio-pectineal line and eminence; angle of inclination; sexual dimorphism in different races.

Dolichopellic,

Platypellic.

Compare the shoulder girdle with the pelvic.

THE AXIAL SKELETON

h. VERTEBRAL COLUMN:

Study the changes due to the assumption of the erect attitude; anomalies in number of vertebræ; compare curves in child and adult; lumbar curve and index:

Kurtorachic,

Orthorachic,

Koilrachic,

Ensellure.

Determine the proportions of the cervical, thoracic, and lumbar regions.

i. SACRUM:

1. Length.
2. Breadth.
3. Index.

Study the normal form and note such anomalies as an open sacral canal; oblique sacrum; irregularities in the number of parts; number of coccygeal vertebræ; *vertebra fulcralis.*

Dolichohieric,

Brachyhieric.

j. THORAX:

1. Primary type.
2. Secondary type.

Determine the number of sternal ribs; sacral and lumbar vertebræ in the embryo; length of floating ribs; cervical ribs; bicipital ribs.

k. STERNUM:

1. Length of manubrium.

2. Length of body.
3. Breadth at base of first sternebra.
4. Thickness.
5. Index, thickness × 100 ÷ breadth.
6. Relation of length to stature.

Test Hyrtl's law. Study the ensiform process; clavicular and interclavicular notches; fissura sterni; sternal foramen; ossa suprasternalia.

l. CRANIUM:

Make outline drawings of the front (norma frontalis) and side (norma lateralis) of a skull with Broca's stereograph and locate the following points:

asterion,
auriculare,
basion,
bregma,
dacryon,
glabella,
gnathion,
gonion,
inion,
jugale,
jugo-maxillary point
lambda,
metopion,
nasion,
obelion,
ophryon,
opisthion,
orbitale,
prosthion,
pterion,
stephanion.

Define the limits of the calvaria and calvarium.

XUM

Craniometrical planes: Arrange the skull for the above drawings with the alveolo-condylion plane horizontal; this plane is determined by the occipital condyles and prosthion:

Broca's horizontal or orbital, by the axes of the orbits;

Auriculo-infraorbital, by the auricularia and orbitalia.

Instruments: Measure the angles and projections with Ranke's goniometer or Verneau's cephalometer:

The arcs with a steel tape;

The larger diameters with Bertillon's calipers;

The smaller dimensions, except the optico-nasion length and the dimensions of the choanæ, with the sliding calipers.

Measurements

1. Capacity. Gage with water, Poll's method, or shot, Broca's method, or if the skull is too fragile use millet seed, or calculate the cubical capacity from the skull modulus (p. 43).
2. Glabello—occipital length.
3. Breadth.
4. Biasterial breadth.
5. Biauricular breadth, at superior margin of external auditory process.
6. Bistephanic breadth.
7. Interpterion breadth.
8. Minimum frontal breadth.
9. Bizygomatic breadth.
10. External biorbital breadth.
11. Internal biorbital breadth.
12. Bijugal breadth, between jugalia.
13. Bimaxillary breadth, maximum.
14. Bialveolar breadth.
15. Maxillary length, prosthyon to posterior extremity of arch; use thin strip of metal and measure in the middle line.

16. Basi-alveolar length.
17. Basi-nasal length.
18. Basi-bregmatic height.
19. Basion-obelion.
20. Basion-lambda.
21. Length of foramen magnum.
22. Breadth of foramen magnum.
23. Malar height.
24. Naso-alveolar height.
25. Spino-alveolar height.
26. Naso-mental height.
27. Orbital breadth, dacryon to maximum extent of largest diameter.
28. Orbital height.
29. Orbital depth, nasion to optic foramen.
30. Bidacryc breadth.
31. Nasal height, nasion to level in middle line of inferior margin of the nasal aperture.
32. Nasal breadth.
33. Palatal length, inner margin of arch anteriorly and exclusive of the palatal process.
34. Palatal breadth, between canines.
35. Palatal breadth, second molars.
36. Dental length, molars and premolars.
37. Height of choanæ.
38. Breadth of choanæ.

Arcs

39. Naso-malar, between outer margins of orbits over nasion.
40. Frontal, nasion to bregma.
41. Parietal, bregma to lambda.
42. Occipital, lambda to opisthion.
43. Total sagittal, nasion to opisthion.
44. Maximum transverse, anterior to external auditory meati.

45. Supraauricular, from superior border of the external auditory process.
46. Preauricular, over the glabella.
47. Total horizontal, over the glabella.

Indexes

48. Cranial, use the quinary nomenclature of the international agreement of 1886.
49. Vertical, height × 100 ÷ length.
50. Breadth-height, height × 100 ÷ breadth.
51. Stephano-zygomatic, bistephanic breadth × 100 ÷ bizygomatic breadth.
52. Upper facial, Kollman, nasion to prosthyon × 100 ÷ bizygomatic breadth.
53. Total facial, nasion to gnathion × 100 ÷ bizygomatic breadth.
54. Naso-malar, naso-malar arc × 100 ÷ internal biorbital breadth.
55. Orbital, height × 100 ÷ breadth.
56. Nasal.
57. Uranic, bialveolar breadth × 100 ÷ maxillary length.
58. Staphylinic, posterior breadth × 100 ÷ palatal length.
59. Dental, length of upper molars and premolars × 100 ÷ basi-nasal length.
60. Alveolar, basi-nasal length × 100 ÷ basi-alveolar length.

Relations of Arcs

61. Frontal—total sagittal, frontal × 100 ÷ total sagittal.
62. Parietal—total sagittal.
63. Occipital—total sagittal.
64. Preauricular—total horizontal.
65. Supraauricular—total transverse.

The Lower Jaw

66. Bicondylar breadth at middle of transverse axis.
67. Bigonial breadth.

68. Symphyseal height.
69. Molar height, vertical height at level of second molars.
70. Ramus height, vertical height of jaw.
71. Minimum ramus breadth.
72. Gonio-symphyseal chord, gonion to gnathion.
73. Condylo-coronoid chord, outer extremity of condyle to coronoid.
74. Bigonial arc, around anterior margin of the jaw.
75. Gonio-zygomatic index, bigonial breadth × 100 ÷ bizygomatic breadth.
76. Mandibular index, molar height × 100 ÷ symphyseal height.

MORPHOLOGICAL CHARACTERS OF THE CRANIUM

Normæ Cranii

a. NORMA FRONTALIS:

(1) *Form of the Face.*—Study the outlines of the face and determine if it is

Chamæprosopic or

Leptoprosopic.

(2) *Frontal Bone.*—Study the angle of inclination; the frontal eminences; the superciliary ridges; compare with those of the Neanderthal calvaria and with Melanesian crania; the glabella, age at which the frontal sinus appears; compare Caucasian with Mongolian; compare the internal angular process of the Caucasian frontal with that of the Veddahs; determine the percentage of occurrence of metopic sutures.

(3) *Nasal Bones and Nasal Opening.*—Study the angle at the median suture of the nasal bones; condition in the Caucasian child: Double inferior border, asymmetry, apertura pyraformis:

Macrolophic,

Microlophic,

Analophic,

Leptorhin,

Mesorhin,
Platyrhin.

(4) *Orbits.*—Observe the form: round, broad, square; direction of the principal axis, horizontal or inclined; roof obliquely inclined in Negroes; ontogenetic changes;
Prosopic,
Mesopic,
Platyopic,
Megaseme,
Mesoseme,
Microseme.

(5) *Superior Maxilla.*—Note racial differences in length; in depth of canine fossæ; history of the premaxilla; percentage of occurrence of infraorbital suture; changes resulting from the loss of teeth and absorption of the alveolar arch.

b. NORMA LATERALIS:

(1) *Facial Angle.*—Note the profile outline;
Orthognathous,
Mesognathous,
Prognathous.

(2) *Nasal Spine.*—Compare with Broca's scale; note racial difference in degree of prominence.

(3) *Profile of Jaws.*—Select six skulls to illustrate the changes taking place during the growth of the individual.

(4) *Malar Bone.*—Determine the racial differences in the degree of prominence; size of the marginal process; divided malar.

(5) *Arch of the Vertex.*—Note the type of arch; Neanderthal and Cro-Magnon types:
Scaphocephalic,
Platycephalic,
Tapeinocephalic,
Metriocephalic,
Akrocephalic.

(6) *Lineæ Temporales.*—Note position:

Feeble,
Moderate,
Well-marked.

(7) *Pterion.*—Note if the processus frontalis be present;

Pterion in K;
Pterion in H;
Epiteric bone;
Racial differences in the length of the spheno-parietal suture.

(8) *External Auditory Meatus.*—Study its form; percentage of occurrence of exostoses within.

(9) *Inion.*—Determine degree of prominence by comparison with Broca's scale.

c. NORMA VERTICALIS:

(1) *Outline.*—Regular, prominent, or flattened in any region:

Megacephalic,
Microcephalic,
Plagiocephalic,
Trigonocephalic,
Chamæocephalic,
Orthocephalic,
Hypsicephalic.
Parietal protuberances;
Sagittal crest;
Fronto-parietal bone.

(2) *Zygomatic Arches.*

Phænozygous.
Cryptozygous.

(3) *Senile Depressions.*—Note the changes in the parietals due to extreme age.

d. NORMA OCCIPITALIS:

(1) *Outline.*—Note if the outline of the transverse arch is pointed, medium, or flat.

(2) *Parietal Foramina.*—Note enlargement or absence.

(3) *Occipital Prominence.*—Observe the racial differences in uniformity of the occipital curve and in the subiniac region.

(4) *Supernumerary Bones.*—Study the morphological significance and percentage of occurrence of interparietal bones at the lambda:

Epactal;

Composite, Complete, Incomplete interparietal.

e. NORMA BASILARIS:

(1) *Foramen Magnum and Occipital Condyles.*—Determine the extent of normal variation; third occipital condyle; fusion with atlas; percentage of occurrence of the postcondylar foramina.

(2) *Paramastoid Process.*—Examine the collections for examples of this rare anomaly.

(3) *Alveolar Arch.*—Compare the types found with those of other races: U-shaped, parabolic, elliptical; torus palatinus.

Dolichouranic,

Mesuranic,

Brachyuranic,

Leptostaphylin,

Mesostaphylin,

Brachystaphylin.

(4) *Palatal Suture.*—Note racial and individual differences in this suture and in the posterior nasal spine.

(5) *Alveolar Hyperostosis.*—This anomaly will be found to occur much more frequently in some American groups than in others.

(6) *Teeth.*—Study the teeth in a series of skulls ranging in age from fetus to adult; their value as a criterion of age in skulls whose age is not known; phylogeny; supernumerary or undeveloped teeth; racial variation; tuberculation; rules for the identification of single teeth; direction of incisors; wear; pathological change: caries, abscess, exostosis, malformation.

(7) *Hyoid Bone.*—Make an outline sketch of the bone and

name the parts; percentage with united cornua; racial variation in the shape of the body.

Sutures

Note the percentage of occurrence of supernumerary sutures not before examined; degree of complexity, simple, moderate, or complicated; condition, open or closed, note whether inner table alone is synostosed; value of the condition of the sutures as a criterion of age; Gratiolet's classification of races; effect of premature synostosis upon the direction of development of the cranium.

Wormian Bones.—Note their number and position; use Broca's scale of size.

Interior of the Skull

(1) Study the sulci, pachionian depressions, meningeal grooves, digital impressions.

(2) *Aymará Fossa.*—Determine the percentage of occurrence; racial differences.

(3) Measure thickness of parietals; diploë; vitreous table. Pachycephalic.

Capacity

(1) Test the three methods of gaging (p. 36) with Ranke's bronze skull, taking the average of five trials and accepting no result that varies widely from the mean. Study Schmidt's corrections for the method with shot.

(2) Study racial and individual variation; compare with the capacity of prehistoric crania.

(3) Determine brain weight from cranial capacity by Manouvrier's, Schmidt's, and Welker's formulæ.

Variations in the relations of capacity and brain weight due to sex and age.

Moduli.—Test the various methods of determining capacity from principal measurements.

Cranial Criteria of Sex

Male.	*Female.*
1. Greater size, weight, capacity.	1. Smaller, lighter; varying in relation to the male skull in the different races.
2. Projecting glabella and superciliary arches.	2. Glabella small or wanting; superior margin of the orbits sharper.
3. Mastoid processes, inion, and crests for the attachment of muscles larger.	3. Mastoid processes smaller, inion and crests smaller or wanting.
4. Frontal sloping backward.	4. Frontal vertical with more pronounced frontal eminences.

Deformed Crania

1. *Pathological Deformation.*—Determine the cause; platybasic; synostosis; posthumous.

2. *Ethnic Deformation.*—Examine the collections for deformations due to head-dress: unconscious deformation.

3. *Artificial Deformation.*—(a) Occipital, (b) frontal, (c) fronto-occipital, (d) fronto-sincipito-parieto-occipital, (e) various.

Identify the *trepanned skulls* in the museum collection.

Statistics

Arrange a seriation table for each of the three measurements, length, breadth, and height, of the series of skulls measured.

Record maximum and minimum.

Extent of variation.

Theoretical mean of variation.

Compare the average, mean, and median values for the three measurements, length, breadth, and height, of crania.

Graphic Representation of Mathematical Terms:

Allen's "Terrace Method."

Method of loaded ordinates.

Bar diagrams.

B.—Human Compared with Simian Type

MATERIAL.—Identify the two species of anthropoid apes represented in the osteological collection and compare the several bones with those of the human skeleton.

a. *Clavicle:*

Length.

b. *Scapula:*

1. Length.
2. Length to base of spine.
3. Breadth.
4. Scapular index.
5. Infraspinous index.

Study also published tables and indexes; phylogeny of the coracoid.

c. *Humerus:*

1. Length.
2. Antero-posterior diameter at deltoid eminence.
3. Transverse diameter.
4. Index.
5. Angle of torsion.

Note the occurrence of the supratrochlear foramen.

d. *Radius:*

1. Length.

Compare the length with that of the humerus: of the arm exclusive of the hand, with the leg exclusive of the foot. Note the presence or absence of the os centrale. Size of thumb.

e. *Femur:*

1. Length.
2. Antero-posterior diameter at middle of shaft.
3. Transverse diameter.
4. Pilastric index.
5. Degree of curvature.
6. Angle of neck and shaft.
7. Angle of shaft from the vertical.

8. Angle of torsion.

f. *Tibia:*

1. Length.
2. Antero-posterior diameter at middle of shaft.
3. Transverse diameter.
4. Index of shaft.
5. Curve of external condyle.

Note the degree of retroversion.

Compare the length of phalanges with that of tarsus combined with metatarsus; the angle of inclination of the tarsus; divergence and small size of the great toe; two-jointed little toes.

g. *Pelvis:*

1. Breadth.
2. Height.
3. Index.
4. Transverse diameter of true pelvis.
5. Conjugate diameter.
6. Pelvic index.
7. Length of coccyx.

h. *Vertebral Column:*

Study the curves; the number of vertebræ in the several segments; total number of presacral vertebræ; long spinous processes of the cervical vertebræ.

i. *Sacrum:*

1. Length.
2. Breadth.
3. Index.

Note the number of vertebræ fused in the Anthropoid sacrum.

j. *Thorax:*

Determine the type; number of sternal ribs.

k. *Sternum:*

1. Length of body.
2. Breadth at base of first sternebra.

3. Thickness.
4. Index, thickness × 100 ÷ breadth.

l. *Cranium:*

1. Capacity.
2. Length.
3. Breadth.
4. Index.
5. Orbital breadth.
6. Orbital height.
7. Orbital index.
8. Nasal height
9. Nasal breadth.
10. Nasal index.
11. Cloquet's angle.

Compare the size of face with that of brain-case; superciliary ridges; low frontal; crests and ridges; position of foramen magnum; shape of palate; teeth, size of canines and third molars, diastema next the canines, number of tubercles on the molars, relative size of the teeth.

Note the extent to which synostosis has progressed, especially in the nasal and premaxillary bones; the transverse palatal suture; inferior border of the orbits as compared with the superior margin of the nasal opening:

Study the skull of the lemur, noting especially the teeth and the absence of the partition between the orbital and temporal fossæ.

ANTHROPOGRAPHY

I. PHOTOGRAPHY:

1. Take the full-length front view of the standing subject on the left third of the plate on a scale of $\frac{1}{12}$.

2. Expose the middle third of the plate for the right side, in exact profile.

3. Expose the remaining third of the plate for the back view.

4. Develop the negatives.

5. Make blue-prints from the negatives.

II. PLASTER CASTS:[1]

1. Make a two-piece mold of a *hand*.
2. Make a mold in three pieces of a *foot*.
3. Make a mold in one piece of a *face*.
4. Make a cast from each mold.

III. FINGER-PRINTS:

Take digital impressions of the right thumb, index, middle, and third fingers of the subjects studied.

IV. ANTHROPOMETRY:

The measurements to be taken upon the living subject are those recommended in the *Notes and Queries on Anthropology*, edited for the British Association for the Advancement of Science, third edition, p. 14.

Measure ten persons.

ESSENTIAL MEASUREMENTS

1. Head . . . . maximum length.
2. " " breadth.
3. Nose . . . . length from base to nasion.
4. " breadth across nostrils, without compressing them.
5. Projections of the head . . . . . from vertex to nasion.
6. " " " " " " mouth.
7. " " " " " " chin.
8. " " " " " " tragus of ear, the base of the projecting portion of the ear which guards the opening of the meatus.
9. Bizygomatic breadth.

9a. Length of face from nasion to under surface of chin.

10. Length of arm from head of humerus to end of middle finger.
11. Length of cubit from elbow to end of middle finger.

[1] Molds and casts must be made in the presence of the instructor.

12. Length of the hand along its back.
13. Length of foot.
14. Sitting height.
15. Kneeling height.
16. Standing height, the head held erect but not bent backward in an unnatural position.
17. Height to chin.
18. Height to sternal notch.
19. Height from internal malleolus to the ground.
20. Span of arms, shoulders horizontal.

ADDITIONAL MEASUREMENTS

21. Maximum breadth of shoulders.
22. Maximum breadth of hips.
23. Diameter of face, external biorbital breadth.
24. " " " " biocular breadth.
25. " " " internal biocular breadth.
26. " " " bigonial breadth.
27. Ear, maximum length.
28. " breadth from base of tragus to outer rim.
29. Height of umbilicus to the ground.
30. Biorbito-nasal arc.
31. Circumference of the chest, in repose, forced inspiration and forced expiration.
32. Minimum supra-malleolar circumference of leg.
33. Maximum supra-malleolar circumference of leg.

34. Tracing of hand.
35. Tracing of foot.

} Mark the sub-styloid and sub-malleolar points and the extremities of the metacarpo- and metatarso-phalangeal joints.

SPECIAL MEASUREMENTS

(*a*) Length of body from seventh cervical spine to lower end of coccyx.

(*b*) biacromial breadth.

(*c*) biiliac crest breadth.

(*d*) Length of arm, acromion to humero-radial line.

(*e*) Length of forearm, humero-radial line to tip of styloid process.

(*f*) Length of thigh, antero-superior iliac spine to external femoro-tibial line.

(*g*) Length of leg, femoro-tibial line to end of *external* malleolus.

(*h*) Height of external malleolus from the ground.

V. DESCRIPTIVE CHARACTERS:

(*A*) After measuring the subjects describe them according to the schedule of characters on pages 12 and 14 of *Notes and Queries.*

(*B*) Determine the color of eyes with the aid of the Bertillon color chart.

(*C*) Examine the fold of skin at the inner angle of the eye as directed and explain the meaning of the terms: caruncula lacrymalis, epicanthus, plica semilunaris.

(*E*) Cut and mount upon a microscopic slide a cross-section of the hair of the head.

SOPHIOLOGY, OR THE SCIENCE OF ACTIVITIES DESIGNED TO GIVE INSTRUCTION

By J. W. POWELL

Sophiology is the science of instruction. I shall treat the subject under two rubrics: first, the nature and origin of the opinions which are inculcated by instruction, and, second, the agencies of instruction.

OPINIONS, OR THE SUBJECT-MATTER OF INSTRUCTION

Opinions are about particles severally or about them conjointly as they are organized into bodies. Particles thus considered are found to have essentials, relations, quantities, properties, and qualities. There are no essentials without relations, no relations without quantities, no quantities without properties, and no properties without qualities, for the world is concrete and there is nothing abstract but in consideration. Essentials, relations, quantities, properties, and qualities we call categories.

When the world is looked upon as concrete, and bodies are discovered, it is found that every one is composed of a group of bodies; but to express the fact without confusion it is better to say that a body is a group of particles, for when one body is considered as a constituent of another it promotes clear statement to say that the compound body is composed of particles. Ultimate particles have never been reached by analysis unless it be in the ether.

Concepts grow as the products of thought. The stream of thought is composed of instantaneous and successive judgments, some of which are duplicated and endlessly reduplicated. While mentations arise from sense impressions, like sense impressions are oftentimes repeated and by association past mentations are

revived, so that there is a vast repetition of the instantaneous judgments as they follow on through the stream of mental life.

It is thus by repeated and revived mentations as judgments that concepts or notions arise. These notions constitute opinions. We cannot make a complete consideration of opinions without considering their origin in the compounding of judgments into concepts.

While opinions often change, they are not necessarily born to die. Correct opinions developed in the individual and propagated from man to man become immortal, while only incorrect opinions ultimately die; but the vast body of opinions as they arise from moment to moment are born only for an ephemeral life. Of those that have appeared upon the stage of history because they have been accepted by the great thinkers, it remains to be said that still the many die and the few live. While they live they are esteemed as science, when they die they are esteemed as errors; hence sophiology can be defined as the science of opinions, and their classification as errors or truths when accepted as such by the leaders of human thought, together with the methods of discovering and propagating such opinions.

We are now to consider how opinions originate and change. For this purpose we will consider them in groups in the order in which they were developed by mankind. These groups fall into five rubrics: animism, cosmology, mythology, metaphysic, and science. Animism, which is the belief in ghosts, first prevailed. We will, therefore, consider this subject first. For the original formulation of this doctrine we are indebted to the great ethnologist Edward B. Tylor.

The science of ethnology teaches the nature and origin of the ghost theory; that is, it discovers the nature of ghosts and explains how men come to believe in them. There are many people who believe in ghosts, the opinion being a survival from primitive society; but with tribal men the belief is universal. Ethnology also teaches the nature and origin of primitive cosmology, which

has now become discredited, though vestiges of it exist in the opinions of simple folk, when it is called folklore. I have previously set forth the nature and origin of animism and cosmology.

MYTHOLOGY

Heretofore in treating of the fundamental processes of psychology the nature of consciousness, inference, and verification have been set forth. Inference alone may and often does result in error, while truth is assured only by verification. Every judgment involves a consciousness and an inference; and if the judgment is valid, its validity can be established and known only by verification. The repetition of an erroneous judgment is often confounded with verification, and thus men come to believe in fallacies. Of the multitude of errors in judgment those most often repeated by mankind, and especially those which have been coined by the leaders of thought, are those which are woven into mythology. Though we have a criterion by which to distinguish true from erroneous judgments, still judgments are compounded into notions that ultimately are exceedingly complex, and it is often found difficult to resolve notions into their constituent judgments; so that while there is an infallible criterion, it is not easily applied. We are not here dealing with the whole subject of psychology, but only with the leading concepts which distinguish science from mythology. That history of opinions which is often called the history of philosophy (but which is mainly the history of metaphysic), together with the history of science, gives us the data of what is here called *sophiology*. Science has already cost a vast amount of research, and we may safely prophesy that only a beginning has been made. It would be an inane proceeding to attempt to forecast what research will ultimately unfold, but perhaps it would not be unprofitable to review in outline the characteristics of the fundamental errors of mankind in so far as they have already been detected.

False inferences primarily arise through referring sense impres-

sions to wrong causes. A term is needed for this error, and it will be called *imputation*. Imputation, then, is the reference of a sense impression of which the mind is conscious as an effect, to a mistaken cause. This wrong cause may be a wrong body or it may be a wrong property.

Let us now see if these two propositions can be made plain. The savage hears the thunder and infers that it is the voice of a bird. This is imputing a sound to a wrong body. Birds have voices, and not knowing the cause of the thunder, the savage imputes it to a bird; but as he knows of no bird with such a voice, he imagines a new and unknown bird. Thus an imaginary bird is created as the explanation of thunder. The creation of imaginary things to explain unknown phenomena is mythology. Thunder may be interpreted as the voice of a bird in such manner by many people until it falls into common speech; thus an imaginary thunder-bird may become the theme of much thought and much talk, and at last a number of stories may grow up about it. The barbarian who drives a span of horses to a war chariot becomes accustomed to its rattle and compares it to thunder. Then the thunder itself is symbolized as the rattle of the chariot of the storm. In this case a new imaginative being is created—a storm god with his chariot in the clouds. So the reference of an effect to an erroneous cause results in a myth.

There may be many analogies called up by the noise of thunder, and there may be many myths established in such manner; but it is manifest that none of them can be verified. In the course of the history of verification, which is the history of science, an hypothesis as to the cause of thunder may be verified; when such verification is reached, all myths relating to thunder die as notions, and the scientific concept is established. All false philosophy, that is, all erroneous explanation, must necessarily lack verification. It may be believed and become current in the philosophy of a people or of a time, and this current belief may be held as science; but sooner or later an erroneous notion,

however widely believed, will present some incongruity to the developing concepts of mankind and will challenge such attention that new hypotheses will be made to be examined until one is verified. When the verification comes, science is born, and the old notion is relegated to mythology. Philosophy is the explanation of causes; whatever else may be involved in the term, this must be involved. It is the central point in philosophy, though not the whole of philosophy. We may now make a definition of the growth of science and the discovery of error. Research, by which science grows, is the verification of hypotheses and the elimination of incongruous notions, and such discarded notions as have been previously and generally received as science are relegated to mythology. Let us illustrate with another example.

Conceive a people in such a primitive stage of culture as not to know of the ambient air. Such people have existed and some even yet exist. In all that culture known as savagery this fact is unknown. The air is unseen; but it often has corporeal motion, and is then called wind, and this wind produces effects. Blow upon your hand, or invigorate the fire with your breath, and then contemplate the wind among the trees: How like the breath is the wind! Now impute the north wind to some great monster beast, and you do only that which millions of people have done before. Many savage peoples explain the winds in this manner, imputing them to monster beasts. In this instance, and in ten thousand others that can readily be supplied, the error of imputing an effect to the wrong cause as a wrong body results in the creation of imaginary bodies, which is the essence of mythology.

When air is unknown there are other things besides breath which the wind suggests. You can blow the fire with a basket tray, and you can fan your brow with an eagle's wing. So the wind suggests a fanning, and may be explained in this manner. But what is it that fans? A bird with wings. If the wind fans it must be accomplished by some great sky-bird. The myths of such sky-birds are common. After this manner a host of imaginary animals are created.

To the wildwood man, who roams the prairie and haunts the forest, the world is the grand domicile of beasts. Beasts are men, and men are but beasts. To his mind the beasts are rather superior to men. The beasts have more magical power and hence are often immeasurably superior to human beings. The savage admires the superiority of the beast and longs for his activities; he is forever contemplating the accomplishment of beasts — the wonders which they can perform — and is envious of their skill in what he supposes to be magic. He sees the trout dart from bank to bank in the brook and is amazed at its magical powers, and from admiration he often proceeds to adoration. He sees the serpent glide over the rock, swift without feet and having the sting of death in his mouth; in this respect he seems superior to man. He sees the chameleon gliding along the boughs of trees in sport with rainbow hues, and is delighted with its magical skill. He sees the eagle sail from the cliff to the cloud region, at home in wonderland. He sees the lion walk forth to conquer with occult majesty. Yes, all the animal world is magical, and men are but degenerate animals. Inspired with wonder, he is filled with adoration, and the beasts are gods. The world is thus the home of men and gods, and the gods are the beasts.

A mythology has sprung up with every primordial language. These languages are found to be many—how many we do not know, but certainly there have been many thousands, and with every tongue a mythology has been developed. The tribes of mankind scattered over the whole habitable earth between the polar walls of ice, living in small clusters, every one having a distinct language and pouring out the generations that have peopled the earth, have created a host of imaginary or mythic bodies.

One of the methods of reasoning by means of which monsters are produced is to impute to one property that which is due to another. Water is transparent and water reflects the light. These two facts are universally observed in savagery. It is something with which men are familiar as an experience growing from

day to day and from hour to hour. There is another fact with which they are almost as well acquainted, namely, that the eye is transparent, and also that it reflects images. The eye is the organ of sight, and it is not strange that the power of vision should be referred to transparency. The reflection of light is an unknown and undreamed property, but transparency is well known, and images are well known, and images appear in vision. Thus, with the Zuñi Indians, as with many of the tribes in North America, the property of transparency is esteemed as vision: all water sees, and the dewdrop is the eye of the plant. It is long before it is learned that transparency is a structure which transfers a motion, while vision is a mentation. Thus force as reflection and vision as mentation are explained as transparency.

The mythology of the Amerinds is replete with myths concerning the powers of thought. There is no error more common than that of confounding thought with force. When the savage theurgist tells us that his hero can think arrows to the hearts of his enemies he makes this mistake. So it is believed that there are mythic men who can think their boats over the river; they can think themselves to the topmost branches of high trees; they can think rocks onto the heads of their enemies. There is no myth more common than this one of confounding thought with force, and there is no myth that has a more venerable history. No Egyptian king has received higher honors, for it is embalmed in the cerements of learning.

We now know that heat is a mode of motion and that cold is a low degree of heat; in the same manner we know that color is a mode of motion, and we measure the number of vibrations in the ether which occur in a unit of time that it requires to produce a variety of color.

The love of knowledge is the most delightful plant in the garden of the soul. In the individual the failure to make correct judgments entails innumerable evils, while correct judgments lead to good. Judgments directly or indirectly lead to action, and

that action is wise as judgments are wise. Every hour, almost every moment of the day, brings the lesson that knowledge is advantageous, and these lessons are repeated by every individual in every generation. Thus there is an acquired and hereditary love of knowledge. Mental life presents a vast succession of judgments, some correct, others incorrect, and as they come they are enwrought in notions that inspire activities, and by these activities the notions themselves are adjudged. Those notions that stand the test are held fast, those that fail are cast away, for men love the true and hate the false. All of this is so evident that it seems commonplace, and yet we are compelled to account for the intensity with which men cling to mythology.

The repetition of a judgment is sometimes a valid confirmation, but it is often the bulwark of fallacy. Judgments many times repeated become habitual, and habitual errors are hard to eradicate, for they are venerable. Errors associate in communities; as they dwell in the mind they constitute a fraternity for mutual protection. Assail one notion with the club of incongruity and a host of notions arise in its defense. Perhaps this will fully explain the fact, which we are to consider, that men invent arguments to sustain myths. He who contemplates this state of affairs may readily fall into despondency, for there seems to be as much mental activity occupied in the invention of false reasons as in the discovery of truth; but on further contemplation it is seen that science has an advantage in that its gains are constant and imperishable, while the gains of error overstep themselves and sooner or later exhibit new incongruities and hence are self destructive.

The appeal to antiquity is the appeal to habit, and the appeal to habit is the appeal to repetition, which must always be distinguished from the appeal to verification. The argument from antiquity is a two-edged sword, and may be an instrument of suicide; but it is the first argument used to support a myth. "It was taught by our forefathers" is inscribed on the banner of

mythology. But can we not use the argument from experience? Yes, if we distinguish the method of verification from the method of repetition. This is our only criterion.

Myths are defended by another argument which must now be set forth. It may be called the argument from intuition. Plants grow from seeds; animals from eggs. The development of the individual from the germ is called ontogeny. The process of ontogeny has been well recognized from primordial human time. Germs also develop from generation to generation. The acorn is a very different seed from that of the plant from which oaks were developed. The egg of the bird is a very different germ from that of the egg from which it was developed through successive generations. This development of germs is also called the development of species. The process is now well known to science, but it was long unrecognized except in a vague way. The process is called phylogeny. Ontogeny and phylogeny together are termed evolution. While ontogeny was more or less fully recognized in antiquity, phylogeny was very dimly discerned and it was supposed to be exceedingly restricted; so that while there might be varieties of plants and animals, it was held that all living creatures are encompassed by barriers beyond which they cannot pass. It could be observed that plants and animals grow from germs, but that races grow by minute modifications of germs accumulating through many successive generations was not so easily observed. That the offspring is like the parent is a more conspicuous fact than that the offspring is a modification of the parent. Therefore it was believed that every existing species is the descendant of a primal species, and the number of primal species has remained constant. Finally it was discovered that species become extinct and that species begin at different periods in the world's history; this was revealed by the science of geology. Thus the notion of constancy of species was finally shown to be erroneous, and it has been replaced by the scientific concept of the evolution of species.

So much of what is now commonplace science must be given that we may understand the doctrine of primordial intuition, which was invented as a defense of mythology. As plants grow from seeds by minute increments through the process of ontogeny, and seeds grow from other seeds by minute increments by the process of phylogeny; as animals grow from eggs by minute increments, and as eggs themselves grow from other eggs by minute increments, so ideas grow ontogenetically by minute increments of judgments and also phylogenetically by minute increments of judgments. Thus the notion grows in the mind of the child by ontogeny, and the idea grows in the mind of the race from generation to generation by a process analogous to phylogeny. As man once believed that plants are inexorably limited to specific forms that are constant, as he once believed that animals are limited to specific forms that are constant from generation to generation, so men have believed that ideas are limited to specific forms that are constant. That which in plants and animals was called the limitation of species, in ideas was called intuition, and by that term was meant the limitation of certain specific ideas. It was recognized that ideas grow or develop in the individual, but it was denied that they develop in the race. Sometimes it was conceded that ideas or concepts grow phylogenetically, that is, they are developed in the race; but it was held that there are certain fixed limits to ideas or notions which cannot change, these limits being fixed primordially in the mind. Now, there have been many modifications and many phases of this doctrine which we cannot here elaborate, but that which is essential to all forms of the doctrine of specific innate ideas has been set forth.

We must now see how this doctrine is used to shore up mythology.

Venerable errors are supposed or affirmed to be universal and also to be innate—that the notions which they involve have been preserved from primordial time, and that they were given to man

at his creation when all species were created. This doctrine of primordial specific innate ideas is one of the most important themes of scholastic learning. Born in savagery, flourishing in barbarism, it is believed in civilization, and its exposition ultimately becomes one of the tests of scholarship. When the doctrine had reached this stage, so-called philosophers or mythologists attempted to defend these primordial concepts. This attempt culminated in the *Critique of Pure Reason.* This defense of mythology by Kant led to the usual result; he, or at least his followers, supposed the argument to be exhausted and the question of innate ideas set at rest when it was stated anew as innate forms of ideas. A calmer generation discovered the incongruity of this doctrine with the concepts of evolution born of science. While the doctrine remained vague, these incongruities were not so apparent; but when it came to be carefully formulated, it was doomed. It may be claimed that the doctrine of the evolution of concepts by experience in the race as in the individual is established.

Primarily judgments are formed as guides to action. In this first stage erroneous judgments are detected by the test of action. If the action proves unwise, the judgment is wrong; but as judgments multiply and are compounded in notions, a new test of error is developed, which is the incongruity of notions. But the discovery of incongruity is not the discovery of the specific error. The incongruity is a relation between two or more notions; some one of these notions must be erroneous, but which one is not revealed by the incongruity. The error is discovered only by submitting the judgments to trial by verification. The incongruity does not reveal a particular error, but only the fact that some error exists; on the other hand congruity does not prove validity.

Mythologic notions may well be congruous with one another. There is no incongruity between the notion of the thunder-bird and the notion of the wind-bird. If there is a bird which roars in the heavens, there may be a bird which breathes in the hurricane:

the one notion serves to confirm the other. It is strange how congruous mythic notions are with one another. Study the mythology of any people as a system, and you will be surprised at the congruity of the notions which it reveals. Compare one mythology with another, and often they will be found strangely antagonistic. This congruity of mythic concepts in one system is a fact so conspicuous as to challenge the attention of thinking men, and it is early discovered and widely used alike in savagery, barbarism, and civilization.

This method of reasoning from the congruity of notions was finally developed in early civilization into a body of doctrine called dialectic. By this doctrine any mythic notion could be expounded as a starting point and other mythic notions brought into judgment before the one selected and found to be congruous, and by this logic proved correct. Proceeding in this manner from notion to notion, many are verified, and the assumed original notion is in this same manner found valid. It is thus that a special system of reasoning in the interest of mythology is gradually developed.

If this system of logic were not already named, I should be tempted to call it Kanosh logic. Kanosh was the chief of a Shoshonean tribe in the central part of Utah, where cinder-cones and lava-beds are found. In years of my youth I was wont to sit at the feet of the venerable Kanosh and listen to mythic tales. Once on a time he explained to me the origin of the cinder-cone and the scarcely cooled lava which in times past had poured from it. He attributed its origin to Shinauav—the Wolf god of the Shoshonean. When I remonstrated with him that a wolf could not perform such a feat, "Ah," he said, "in ancient times the Wolf was a great chief." And to prove it he told me of other feats which Shinauav had performed, and of the feats of Tavoats, the Rabbit god, and of Kwiats, the Bear god, and of Togoav, the Rattlesnake god. How like Aristotle he reasoned!

There is a phase of the defense of mythology which must not be neglected, although its contemplation is a source of sadness

because it is an exhibition of the worst traits of mankind. It has already been seen that in the defense of mythology subtile arguments are produced, systems of psychology are born, and methods of logic are invented. The notions of mythology are not only woven into theories of institutions, but institutions are devised for their propagation and defense.

Institutions are founded in the natural conditions for family organization. The love of man for woman and the love of woman for man, together with the love of parents for children and children for parents, are all involved; thus institutions have their origin in domestic love. The social life which develops from this germ, having its roots in domestic love and sending its branches into all the ways of life, constitutes the sheltering tree to protect mankind from the storms of foreign war and internal conflict. Peace, equity, equality, liberty, and charity are concepts at the foundation of institutions. An attack upon institutions is thus an attack upon all these sacred principles, so man defends them to the last extremity. On the other hand, men are constantly seeking to improve them, and that which is beneficent to one may be malign to another. When the tendrils of mythology are entwined in the branches of institutions, the attempt to substitute science for myth often appears to be an attack upon the institutions in which it is entwined, and thus the reformer and the defender come to blows. When the defender of venerable mythology is also the defender of ancient institutions, he is easily convinced that his warfare is holy. When he is the constituted and official defender on whom the armor is buckled and by whom the sword is grasped, he is watchful and ready for the fight. Then his honor is at stake and his emoluments threatened.

One element of this controversy — the saddest of all — is the passion for thaumaturgy which mythology produces. Then unknown beings with occult attributes people the world, and the air reeks with mystery. Men who deceive themselves are deft in the deception of others. The love of thaumaturgy becomes one of

the monster passions of mankind that stifles the pure love of truth. When thaumaturgy becomes a source of gain, and greed is wed to wondercraft, there springs from the union a progeny of devils that wreak on the teachers of truth the tortures of rack and fagot.

In savagery names are believed to be natural attributes of the objects which they signify. The many significations which the same word may have are usually related to one another, but even when they are not related they are so habitually associated that affinities are constantly suggested. The development of science to an important degree depends on the distinct recognition of different meanings, and in order that scientific reasoning may proceed it is always found necessary to define words with exactness and to adhere to constant meanings; but mythological reasoning does not observe these precautions, and often succeeds in making its arguments plausible by the uncertain use of words. It must not be supposed that this is a device on purpose to deceive, for it is often a potent agency of self-deception.

Trope is not an unmixed evil, although it is a dangerous device. When knowingly used and legitimately derived it adds power and vigor to language, and we have already seen that it is a necessity in nascent knowledge. Ultimately it becomes the foundation of the highest fine art known to man, for it is an essential element in poetry; but that which is legitimate and useful in poetry is the bane of scientific reasoning, especially when it is used without comprehension. Mythology is thus eminently tropical. While it is held as science, its tropes are believed; when its incongruities are discovered and its tropes recognized, mythology is often supposed to be a crude poetry. When dialectic methods of reasoning prevail, equivocal or duplicate meanings of words are common. At last mythologic reasoning discovers the advantage to be derived from the use of words with many meanings, and it becomes an essential and recognized element in such reasoning. Hegel, who is a master of dialectic, not only lapses into many equivocal meanings, but purposely uses them

and boasts of the advantage to be derived from his native tongue by reason of the many meanings which its words present. His first great work, *The Phenomenology of Mind*, is esteemed by him and by his followers as the effort by which the foundation of his philosophy was laid. When this work is read paragraph by paragraph and the meanings of words compared throughout the entire book, it will be found that the argument depends on the equivocal use of words. One can imagine the delight with which he hailed the discovery that he could make an attractive argument and a chain of seemingly invincible reasoning in this manner. His followers have claimed for him some profound secret, but with this key to the Hegelian riddle it is easily read.

METAPHYSIC

Metaphysic is a system of explaining how the essentials of bodies are generated one from another.

Pythagoras taught that unity as number is the primordial essential from which others are derived, the conception being in the spirit of tribal cosmology in which all things are generated or begotten by parents.

Plato considered extension as form to be the primordial property. He exalted mind perhaps more than any philosopher before his time, and with transcendent literary skill sounded its praises. But as he considered form to be the property from which it was derived, he translated mind into terms of form and thus succeeded in imposing upon all coming time the word for form as the term signifying notion or concept. Thus idea, which primarily signified form, is now a term of mind.

Aristotle seems to have considered force as the primal property from which all other properties are derived, for thus I interpret his doctrine of energy. Certain it is that since his time there have been metaphysicians who have held this doctrine. Perhaps this error has more widely prevailed than any other doctrine of the genesis of the essentials. Aristotle's theory of mind is vague,

and his reader may easily defend the proposition that he derives energy from mind, rather than mind from energy.

Spencer resolves extension into force, and impliedly, though not overtly, resolves duration into force in his discussion of the doctrine of evolution; and finally he resolves mind into force, so that Spencer is the modern champion of this theory. Of course Spencer does not consider the derivation to be parental genesis, but genesis by evolution. The American philosopher of this school, Mr Lester F. Ward, also derives mind from force by evolution.

Still other philosophers have taught that persistence is the primal property, from which all others are derived. This philosophy has been taught as a reification of being, and is known as *ontology*. The term "being" signifies existence, but it is also used in Aryan languages as the common asserter. This double use has always been found in ontology. The prevalent philosophy of medieval time was ontology. Being is not held to be the father of properties, but rather the substrate.

Idealism is the doctrine that the other properties are produced by mind, the foundation of which is consciousness. It began with Berkeley and has been elaborately formulated in the German of Kant, Fichte, Schelling, and Hegel. Mind is reified, and the physical world has its genesis in the human mind, or, as some think, in the mind of God who endowed the human mind with faculties to think his thoughts as he thought them in creation. The physical world is thus an illusion called phenomenon, the reality being noumenon or thought. Two schools of idealists are found—one speaks of noumenon as mind, the other as will. In one school mind is the only substance, in the other will is the only substance.

The essentials with their relations, quantities, properties, and qualities have severally given rise to a system of metaphysic. As we have called them they are the system of Pythagoras, the system of Plato, the system of Aristotle, the Medieval system, and the system of Berkeley. The last system, when will is substi-

tuted for mind, may be called the system of Schopenhauer, as a variety of the Berkeleyan system, which also has many other varieties.

We are now prepared for a definition of metaphysic: Metaphysic is the doctrine that one of the essentials of a particle or body is primordial, or the one from which the others are derived. They may be derived by parental genesis, as in ancient metaphysic; by evolution, as in modern materialism; or by creation, as in idealism.

The Pythagorean and the Platonic systems have perished from the earth. The idealists claim that Plato was the founder of their system, and that Aristotle was also a believer in it. Thus they interpret these two Grecian metaphysicians, as I think, erroneously. The medieval system is waning, though it may have some disciples; but apparently they have become idealists. There yet remain to us the Aristotelian and the Berkeleyan. The Aristotelian has been revived by Spencer, greatly expanded and placed upon a clearer foundation; Spencer has many illustrious disciples. Idealism in some one of its many forms prevails widely among metaphysicians. Enlisted among its disciples are many scholarly men who take a leading part in the metaphysic of the schools. They have usually not occupied themselves with the physical sciences, but there are some illustrious exceptions. The Aristotelian system, especially as revived by Spencer, is usually called *materialism*. Materialism and idealism are now rivals in the metaphysical world.

Materialism is a theory of the existence of the world as constituted of forces. This theory is perhaps best expounded by Boscovich as points of motion, not points in motion; centers of motion, not centers in motion. There are no atoms or molecules in motion, but there are atoms and molecules of motion; there are no stars in motion, but stars of motion; there are no waters or gases in motion, but there are gases of motion; there are no rocks in motion, but there are rocks of motion; there are no plants in

motion, but there are plants of motion; there are no animals in motion, but there are animals of motion; there are no thoughts that are the motions of brain particles, as there are no brain particles, for thoughts are motions themselves.

Oftentimes idealism is a theory that all the material objects of the universe, other than human beings, are created or generated by mind, and that human beings are the real things and all other things are but the concepts of human beings. There are no stars, but only human concepts of stars; there are no waters, but only human concepts of waters; there are no rocks, but only human concepts of rocks; there are no plants, but only human concepts of plants; there are no lower animals, but only human concepts of lower animals. God and human beings are realities which manifest themselves to one another in perception and conception as ideas in the objective world.

Sometimes it teaches that science is a method of expressing ideas; it is but a system of language and has no other significance than that of a system of language. There is no objective concrete world with which science deals; but there are ideas with which science deals, and the whole function of science is to reduce these ideas to their simplest expression. There is no objective standard of truth; there is only a subjective standard of opinion, and all scientific research is the attempt to formulate these opinions or ideas or concepts or perceptions in universal terms. Science is only a device of language; mathematics is only a device of equations; chemistry is only a device of atoms; astronomy is only a device of worlds; geology is only a device of formations; botany is only a device of cells; biology is only a device of organs. All of these devices are useful for linguistic purposes; they do not express objective reality, but only subjective ideas. The world is a realm of ideas and words; it is not a realm of objective real things!

Idealism accuses all scientific men of being materialists, and it divides mankind into two groups—the good and the evil. The

good are idealists, and the evil are materialists. The idealists are from heaven and the materialists are from hell. Idealism accuses materialism of ignoring all values in the world; it forever seeks to belittle scientific research. Chemistry is only a controversy about words; astronomy is only a disputation about words; physics is only a disputation about words; geology is only a disputation about words; botany is only a disputation about words; and zoölogy is only a disputation about words!

Materialism accuses idealism, as being the enemy of science, of rejecting every scientific discovery until it can be translated into terms of idealism, being the great bulwark of ignorance and the fortress of superstition. As idealism is interpreted by materialism, the accusations are true; and as materialism is interpreted by idealism, the accusations are true. Materialism is arrayed against religion, and idealism is arrayed against science.

Idealism is a theory that there is no objective reality, or, to use the language of modern idealism, there is no trans-subjective reality. Symbols are signs of ideas, but not signs of objects. The objective world thus becomes the creation of thought. The apparent or phenomenal objective world is created magically by thought. There are no stars as objective realities; there are only stars by the magic of thought. Astronomy is not a science of orbs which depends on the existence of objective realities; but it is a science of words which depends on our concepts, and contributions to astronomy are only contributions to language and consist only in a better method of using symbols as words to describe our concepts. There are no atoms or molecules or substances as science teaches; but there are concepts of atoms, molecules, and substances, and all contributions to chemistry are but contributions to language by which symbols that do not represent reality, but only concepts, are made more useful as linguistic devices. There is no such thing as motion; motion is but the product of thought. We think there is motion, but it has no objective reality, and contributions to dynamics are only contributions to language!

During the last decade Ladd has published a volume, titled *What is Reality?*, in which he sets forth in a masterly manner the concomitancy of the categories. In this great work he treats of the fundamental elements in the fallacies of materialism and idealism, and the metaphysicians of both schools must reckon with him before again stating their systems.

The stream of thought is a succession of judgments, and judgments are made of essentials; hence we cognize by essentials. Judgments are made instantaneously, hence our judgments are infinite, as that term is used in mathematics; they are so multitudinous that we cannot enumerate them in statable quantities. Judgments are repeated again and again and thus become habitual, when the objects of judgment are again presented or represented. These abstract judgments are concreted or integrated; for when a judgment is made of one essential, the others are implicated, posited, or presupposed; thus judgments become vicarious. If I judge that a body is one I implicate that it has extension, speed, persistence, and consciousness.

No particle or body can exist without all of its essentials, for they are concomitant. This fact is a refutation not only of materialism and idealism, but of all metaphysical systems.[1]

In metaphysic qualities are not discriminated from other categories. The same number is few or many from an ideal or an adopted standpoint of consideration. The sands of the lake are many compared with the sands of the pond, but the sands of the lake are few when compared with the sands of the sea. The stars of the Milky Way are many compared with the stars of Orion; the stars of the Milky Way are few compared with all the stars of the firmament. So forms are large or small from artificial standpoints. Structures are simple or complex in the same manner. Forces are strong or weak with different purposes in view; times are long for the same reason, and causes are trivial or potent.

[1] For the demonstration of the concomitancy of essentials, see my volume *Truth and Error*.

Judgments are wise or unwise when the view comes, and the wisdom of yesterday is the folly of today. Men have distinguished but slowly between qualities and other categories, and there has always been a tendency to explain unknown categories as qualities, for often they have been dwelt upon before their corresponding categories were known. In the ordinary course of human reason the first incentive to an investigation of the other categories is derived from a knowledge of their qualities, and so long as they are unknown they are believed to be only qualities.

It is this characteristic of qualities that seems to give warrant to idealism. Qualities always change with the change in view, and they are ideal when we consider things with relation to purposes. You can always discover that idealists consider only qualities among the categories, and confuse all others with them. Even while I am writing this statement there comes to hand a new work on idealism, titled *The World and the Individual*, by Royce. On every page of this book he considers qualities and only qualities. On page 209 he says:

> Those other objects of common human interest are viewed, by common sense, namely, not as Independent Beings, which would retain their reality unaltered even if nobody ever were able to think of them, but rather as objects such that, while people can, and often do think of them, their own sole Being consists in their character as rendering such thoughts about themselves objectively valid for everybody concerned. Their whole *esse* then consists in their value as giving warrant and validity to the thoughts that refer to them. They are external to any particular ideas, yet they cannot be defined independently of all ideas.
>
> Do you ask me to name such objects of ordinary conversation? I answer at once by asking whether the credit of a commercial house, the debts that a man owes, the present price of a given stock in the stock market, yes, the market price current of any given commodity; or, again, whether the rank of a given official, the social status of any member of the community, the marks received by a student at any examination; or, to pass to another field, whether this or that commercial partnership, or international treaty, or still once more, whether the British Constitution,—whether, I say, any or all of the objects thus named, will not be regarded, in ordinary conversation, as in some sense

XUM

real beings, facts possessed of a genuinely ontological character? One surely says: The debt exists; the credit is a fact; the constitution has objective Being. Yet none of these facts, prices, credits, debts, ranks, standings, marks, partnerships, Constitutions, are viewed as real independently of any and of all possible ideas that shall refer to them. The objects now under our notice have, moreover, like physical things, very various grades of supposed endurance and of recognized significance. Some vanish hourly. Others may outlast centuries. The prices vary from day to day; the credits may not survive the next panic; the Constitution may very slowly evolve for ages. None of these objects, moreover, can be called mere ideas inside of any man's head. None of them are arbitrary creations of definition. The individual may find them as stubborn facts as are material objects. The prices in the stock market may behave like irresistible physical forces. And yet none of these objects would continue to exist, as they are now supposed to exist, unless somebody frequently thought of them, recognized them, and agreed with his fellows about them. Their fashion of supposed Being is thus ordinarily conceived as at once ideal and extra-ideal. They are not "things in themselves," and they are not mere facts of private consciousness. You have to count upon them as objective. But if ideas vanished from the world, they would vanish also. They then are the objects of the relatively external meanings of ideas. Yet they are not wholly separable from internal meanings.

Well, all of these facts are examples of beings of which it seems easiest to say that they are real mainly in so far as they serve to give truth or validity to a certain group of assertions about each one of them.

Yes, if ideas were to vanish from the world, qualities would vanish also.

What, then, are qualities; and can we define them? Qualities are attributes of good and evil. This definition is perfect, for it is inclusive of all and exclusive of others. All that has been written in this series of articles is designed to set forth their nature. Qualities naturally fall into five groups: There are esthetic qualities, or qualities of pleasure and pain; there are industrial qualities, or qualities of welfare and illfare; there are institutional qualities, or qualities of morality and immorality; there are linguistic qualities, or qualities of truth and falsehood; there are sophiological qualities, or qualities of wisdom and folly.

Those attributes which we call qualities are always found in antithetic pairs. All human activities are performed for purposes, and these purposes are either good or evil; no purposes can be neutral. Hence we see that purposes play a role of transcendent importance *in human affairs*. Notwithstanding this, there are other categories of reality in the universe, but personal interest in qualities masks them from the consideration of the metaphysician.

If there has been one cause for the longevity of myths more potent than another, it has been the doctrine of phenomenon and noumenon as it is held in metaphysic. How often have men erred in judgment when brought to the test of action! What multitudes of judgments have proved to be erroneous by the test of experience through verification! When men contemplate the mistakes made in every hour of waking life; when men contemplate the hosts of erroneous notions that they have entertained, when they realize that the result of thought is mainly the reconstruction of notions, it is not strange that men should despair of all certitude and cry, "We know not reality, but only appearance!"

Aristotle formulated the laws of disputation as laws of thought itself, and so the logic of scholasticism is but the logic of controversy. When men compared theories of the universe, they found that any theory could be maintained with plausibility because they yet remained ignorant of the laws of verification; it was not strange that a sense of illusion seemed to pervade the universe. Thus the metaphysical doctrine of phenomenon and noumenon is seemingly confirmed.

SCIENCE

It would be a pleasing task to outline the history of science. Science is as old as error. Although human fallacies began with primordial man, knowledge also began with primordial man, and the two have grown together. Science has more and more prevailed, and error has more and more succumbed to its power. As

the errors of animism, mythology, cosmology, and metaphysic have been overthrown, there are many who still entertain them, and scientific men have come to call all of these errors folklore, and folklore itself has come to be the subject-matter of science.

The study of folklore is the study of superstitions. Superstitions are opinions which stand over from a lower into a higher state of culture.

There are people who can move their ears at will; the lower animals can do this, but only a few human beings can wink their ears. Organs that are useful in lower species may remain in an imperfect and practically useless state in a more highly developed species; they are then called vestigial organs. As there are vestigial organs, so there are vestigial opinions. These vestigial opinions are commonly called superstitions. When we come to investigate vestigial opinions and treat them as objects of science, we no longer call them superstitions, but we call them folklore.

The science of folklore may be defined as the science of superstitions, or the science of vestigial opinions no longer held as valid. Yet such erroneous opinions that hold over from the days of greater ignorance to the era of modern scientific research are found to be of profound interest in the revelations which they make of the nature of superstitions themselves. We might neglect them, or seek to substitute for them valid opinions. However, science does not hesitate to investigate any question, and even the natural history of superstitions has come to be a profoundly interesting and instructive science.

Some years ago a movement was made in Europe and America to investigate superstitions themselves on the theory that they are valid. Societies were organized in London, Paris, Berlin, and Boston for the purpose of determining whether or not there is substantial truth in error itself. This is the function of the Societies for Psychical Research, the purpose of which is to discover the truth of dreams, the validity of necromancy, and the reality of ghosts. I have a suspicion that the Societies for Psychi-

cal Research are rather instrumental in increasing superstitions than in dispelling them, and that we reap the natural fruit of these researches in the increased prevalence of such abnormal cults and arts as christian science, mind-healing, spirit-rapping, and slate-juggling. Be this as it may, there is one result growing out of the modern Societies for Psychical Research which I hail with pleasure: In the transactions of these societies there is put on record a great body of superstitions, all of which are valuable material as folklore.

Remember it is the science of superstitions, and the science must deal with the fundamental errors of mankind (as the phenomena of nature have been interpreted by savage and barbaric peoples), and how these errors as vestigial phenomena have remained over in civilization and are still entertained. Of course the ignorant entertain them by wholesale; but it is not the ignorant alone who entertain superstitions. Superstitions are domiciled in many parlors, they are paraded on many platforms, they are worshipped in many temples, and they lurk even in scientific halls and appear in scientific publications and are taught by scientific men. There is much folklore in this world, and sometimes it may be found in strange company.

It is thus that the study of folklore reveals the origin and nature of superstitions and makes the grand scientific distinction between valid concepts and uncanny visions.

The habit of believing in the impossible, of expecting the absurd, and of attributing phenomena to the occult, gives rise to two classes of magical agencies which, from savagery to the highest stages of culture, have played important roles in the explanation of magic. These are the beliefs in mascots and taboos.

Those who dwell on the mysteries of life, especially as they are revealed in ecstasy, hypnotism, intoxication, and insanity, are forever looking for mascots or mysterious causes. Such occult agencies are sweet morsels to superstitious people, just as scientific men delight in the discovery of scientific facts. What a

wonder it was to scientific men to discover that bones could be photographed through their covering of flesh! The discovery of the Röntgen rays was held to be so important that the discoverer was awarded a great meed of praise. But the potency of the left hind-foot of a graveyard rabbit plucked in the dark of the moon is held by superstitious people to be of more importance than the Röntgen rays. More people believe in mascots than believe in telephones, and those who believe in mascots believe that telephones are magical. In the same manner taboos perform wonderful magic feats in the notions of many persons. In savagery there are many taboos, and men must not do this thing nor that thing lest their enterprise should fail. Survival of taboos still exists; *e.g.*, thirteen persons must not sit at the table lest one should die. So mascots and taboos still have their influence in civilized society.

INSTRUCTION

Having set forth the nature of the opinions held by mankind in different stages of culture, and the way in which science supplants superstition through the agency of verification, it yet remains for us to characterize the agencies by which opinions are propagated. This gives rise to the fifth great system of arts, the last in the pentalogic series: the arts of *sophiology*. A brief characterization will be sufficient for our purposes.

Sophiology is the art of instruction.

NURTURE

It is found that in organized society man has developed five distinct agencies for instruction. In infancy parents instruct their children. As children advance in age, other members of the family take part in the work; and still as the child advances in years, his associations are enlarged and all of those persons who constitute his social environment take part. Instruction of this character is well recognized under the term *nurture*.

Oratory

In tribal society an important agency of instruction is found in oratory. Every patriarch of a clan, every chief of a tribe, every shaman of a brotherhood, every chief of a confederacy, must be an instructor of his people. This instruction is necessarily conveyed by oratory; hence in tribal society a comparatively large number of persons are spokesmen or official orators. In the frequent assemblages of the people by clans, tribes, phratries, and confederacies abundant opportunity occurs for the exercise of this office, and when important matters are up for consideration in the council, every man has a right to a voice, and his influence in the tribe depends largely on his powers of persuasion as an orator. Oratory is therefore very highly developed in tribal society. At the dawn of ancient civilization the Greek philosophers employed this method of conveying instruction. In national society there is still opportunity for oratory in the more highly developed council of state.

There are other occasions for oratory. There still remains a field for the employment of oratory in religion, for the religious teacher must be an orator, and one day in the week is set apart for religious instruction. The method of instruction by this means has a long history, and through it mankind have received a large share of their instruction, although in modern times it has been employed chiefly in teaching morals.

Education

In modern society a distinct agency is organized for the instruction of youth in addition to those included under the terms nurture and oratory. This new instruction is *education*.

In the highest civilization the years of adolescence, and sometimes of early manhood, are consecrated to education, so that much of the time of individual life is occupied in this manner. A multiplicity of schools is organized, a host of teachers are employed, buildings and apparatus are used, so that the cost of

education is rapidly advancing *pari passu* with the growing appreciation of its importance. The theory and art of education are undergoing rapid development. We may contemplate with surprise the development of manufacturing interests; we may gaze with wonder at the development of the agencies of transportation; we may consider with profound interest the development of commerce and the modern agencies upon which its highest stages depend, but the wonder of wonders is the development of modern agencies of education. As human muscle is supplanted by electricity, the tallow dips by the incandescent light, the coin by credit, so the text-book is supplanted by the library, the teacher's rod by the instructor's illumination, and the memorized word by the informing idea.

Publication

In early times many manuscripts were written and important ones were often copied, but altogether this method of multiplication was infrequent. A new civilization began with the events and discoveries that came upon the world about the time of the discovery of America; in this epoch the art of printing was invented, through which was developed a new system of instruction which has already become universal in civilized society and whose potency for progress can hardly be underestimated. This new system is publication. Books and periodicals constitute the fourth great agency of instruction.

Research

Research is the potent agency for the development of new opinions. Aristotle is credited with organizing research. Intermittent and feeble research extended from his time on until the epoch of modern civilization. The discovery of America signalizes the beginning of this epoch. Prior to this time research was dangerous; the propagation of new truth was held to be impiety to the gods, old opinions were held to be sacred, and terrible punishment was the reward of him who taught new truths

to the world. Prior to this time even the discoveries in astronomy were held by men only in secret, and the flat earth with a revolving sun was the sacred opinion. When the New World was discovered it was so brilliant an example of the results of the belief in a scientific doctrine that science itself was exalted and the scientific man could hold up his head and walk the earth the peer of all men. Since that time research has been organized in many fields and hosts of men have become votaries to research, and now the fifth great sociologic agent is firmly established among the institutions of civilization.

We thus have Nurture, Oratory, Education, Publication, and Research as the five grand arts of Instruction.

THE CHUKCHI OF NORTHEASTERN ASIA

By WALDEMAR BOGORAS

Early history.—On some maps of the eighteenth century the country east of Chaun river and south of the Anadyr is not included in Asiatic Russia proper. This country, called Chukotskaya Zemlitsa ("Small Land of Chukchi") in old Siberian documents, was inhabited, according to the cartographers of the period, by a very fierce and warlike people who, when captured, took their own lives. The name of this people is Chukchi, and the correctness of the description is confirmed by the history of their relations with the Russians as well as by their present character.

Hostility between the Chukchi and the Russians began with their first contact in the middle of the seventeenth century. The Cossacks, who came from Kolyma and who in their contests with the Lamut, Yukagir, and Chuvanzi had been accustomed to easy victories and often to bloodless submission, met with most obdurate resistance; this was the more surprising as the people offering it had no social organization, but with remarkable unanimity of purpose followed the lead of their most experienced warriors.

In this struggle the Cossacks, despite the valor and wariness of their last leader, Major Pavlutsky, were finally utterly defeated. The Russians, in 1774, by orders of the government, destroyed one of their own outposts, Fort Anadyr, the supplies being sent to Kolymsk and Gishyginsk. Russian and Chukchi traditions abound in vivid pictures of this conflict, although naturally differing in their points of view. In the Russian account Pavlutsky was defeated because some of his followers, exhausted by the hardships of the campaign, did not appear in time to support him in the decisive battle. The leader of this force was one

Krivogornitzyn, and his last descendant, Mitrophan Krivogornitzyn, a blind beggar, lives in the village of Pokhodsk at the mouth of Kolyma river. I was there told by some old men that his sad fate was in punishment for the treachery of his forefather.

After repeatedly defeating the Cossacks, the Chukchi went to the Kolyma in baydaras and devastated the Russian villages. One of these settlements now bears the name Pogromnoye, from *pogrom*, "devastation"; while another is called Douvannoye, from *douvanit*, "to divide booty."

According to Chukchi tradition, Pavlutsky and his companions treated the inhabitants with incredible cruelty. They destroyed the entire population, cleaving men with axes and tearing women into halves by the feet; they drove away the reindeer herds or butchered them for food for their dogs, and carried off everything on which they could lay hands. The Chukchi camps nearest to the Russians were deserted, and the inhabitants, fleeing eastward, had decided to cross to America when the defeat of Pavlutsky changed the entire aspect of affairs.

Chukchi tradition likewise alludes to treason, but names as the traitor the son of the Chuvan woman with whom Pavlutsky lived. He was reared by his stepfather, but was secretly in communication with the Chukchi. The capture and horrible death of Pavlutsky are dramatically described. I will give only the close of the story from my collection of Chukchi folklore. There are several accounts of the final defeat of Pavlutsky, who is called Yakoúnnin, a name probably derived from Jacob, although the Christian name of Pavlutsky was Theodore. Even today many Russians assume names quite different from their Christian names. The reason for this custom is not given, but it is probably due to a desire to conceal their real names from sorcerers and other evil-doers. Following is the Chukchi account:

"Yakoúnnin, you bad one, murderer!"—said the people to the captive; "we have no iron axes with which to cleave you as you have done our people, but we will in some way make you feel the pain of death!"

XUM

They stripped him of his armor and put on his head a reindeer bridle, with a long strap, and made him run with bare feet in a circle through the snow. When he grew tired they lashed him with reindeer-whips, every stroke drawing blood. Now, Yakoúnnin, the wicked murderer, was exhausted; his back was sorely lacerated and his tongue lolled. They brutally dragged him on until he fell, when they again lashed him with whips like women beating a tent cover. Yakoúnnin sprang to his feet and again ran in a circle, his tongue hanging to his navel. Again he fell, and could rise no more. Then they made a huge fire and roasted him alive. His flesh was cut off in thin slices, but the roasting was continued until Yakoúnnin died.

After the death of Pavlutsky intercourse with the Chukchi was broken off and was not renewed until 1789. The persuasions and gifts of Zashiversk were mainly instrumental in bringing this about.

The warlike spirit of the Chukchi was manifested not only against the Russians but against neighboring tribes, and especially against the Tánñit, which name, in the Chukchi language, designates the Koryaks as well as the Chuvanzi. Chukchi tradition is replete with accounts of these wars. The names of their most prominent heroes are still cherished, and many families boast of their descent from them. The principal leader in these hostilities was Lawtîlîwadlîn ("Man-beckoning-with-a-nod," or "Man-with-a-bear's-neck"); his fellow champions were Amloo, Bone-face, Chîmkîl, Elénnut, Ajñairhin, Tawe, Nankachhat, and others.

Lawtîlîwadlîn is described as a "destroyer of homes." "At the sound of his voice the courage of the strongest fails, and women slay their children that they may not fall into his hands. His arrows fall like rain." Another warrior, Elénnut, towers above the multitude like a fir; his hands reach to his knees; his fists are like two large wooden bowls. He runs in bounds through the deep snow. Another warrior, Nankachhat, has a lance with a blade a yard in length. When the ice on Nomwaan river breaks up, he stretches himself across the water and dams the ice, while caravans pass over his body, etc.

Recent habitat.—During the last half-century, thanks to their friendly intercourse with the Russians, the Chukchi have been much less warlike and brutal, and, barring a few exceptions, they have not been at war with their neighbors. The spread of the Chukchi during the last fifty years through the tundra, westward and northward, caused by the great increase in their herds, has also tended toward their civilization. On the whole the Chukchi are virtually newcomers in the Kolyma district, although formerly the Russians came in contact with them on that river. At the beginning of the nineteenth century Baranikha river, 200 miles east of the Kolyma, was the western limit of Chukchi territory. From the second quarter of the century the reindeer Chukchi, as their herds increased, extended their range on the west and north, occupying the entire territory as far as the wooded area, and either driving the original inhabitants, the Lamut, farther into the woods or settling side by side with them.

Barter.—With the renewal of intercourse with the Chukchi, trade revived. Near the confines of the Chukchi territory a fair was held each spring in a small fort, and trade soon reached the large sum of 200,000 rubles ($154,000) per year. From the first the high-priced American furs (foxes of the most valuable sort—"flame foxes," so called,—gray-neck foxes, beavers, and martens) were the most valuable imports. Russian goods were carried to the American coast and thence inland. The chief of these traders were the coast Chukchi, many of whom devoted their whole time to barter, going in the summer to America on their baydaras and in the winter journeying to the fair, with reindeers or dogs, on sledges. Trade is still carried on in this manner, and the costliest furs are taken by these merchants to the fairs of Anadyr and Anuy. Traffic was conducted between Asia and America before the coming of the Russians. The products of reindeer breeding were interchanged with those of maritime pursuits—ground-seal and walrus skins, and straps, seal-oil, whale-bone, etc. This traffic is now very considerable,

for all the tribes of the coast require reindeer-skins as well as clothing of this material.

The wandering Chukchi tradesmen, in their half-fabulous tales, vividly describe the insatiable longing for tobacco manifested by the most distant tribes. A typical account follows:

> Far off, deep in the woods, live an invisible people—a specter folk—very rich in fox-skins. These people continually crave tobacco. Having reached their abiding place we cast toward the edge of the wood a small packet of tobacco which we always carry. Immediately the whole wood resounds with the cry "Tobacco! Tobacco!"—but nobody can be seen. Specters flit on all sides with foxes in their hands and with large bags. The foxes are seen, but the people are invisible. Then we fling toward the wood our bags of tobacco, and shortly afterward the bags are flung back filled with foxes; but still nobody can be seen.
>
> Farther on live men who at will dissever themselves. They stay among the trees on the shores of the lakes, cleft in halves, but at the slightest rustling their parts come together and they dive into the water.
>
> They, too, have a longing for tobacco, and exchange large fish and otters for it. Then again in the woods exist men not larger than the forearm of a man. They subsist on trees and buy tobacco with the skins of the lynx and the muskrat. Then again there are shaggy people with the body of a polar bear but with the face of a man. These are the best of all, since for a little snuff from a tobacco pipe no larger than a nail, they will give a marten. And all men of that country, large and small, covet tobacco through all their lives.

During the last twenty-five years trade by American whalers in Asia and America has reduced the importation of American furs, the few that are now brought in going to Anadyr. Trade with the Chukchi on the Kolyma is now limited to the exchange of Russian tea, tobacco, and hardware for the products of local reindeer-breeding and for the furs obtained by the reindeer Chukchi of Kolyma. The yearly traffic at the Anuy spring fair now aggregates only 15,000 rubles.

Tribute to Russia.—During the eighteenth century many attempts were made to levy a tax on the Chukchi, in return for which the government agents have freely offered gifts which far exceeded in cost the whole amount of this *yassak*. About the

middle of the nineteenth century some 150 men paid tribute, consisting of a red or white fox-skin, each receiving in exchange tobacco and utensils of at least twice its value. In 1870, Baron von Maydell, governor of the Kolyma district, induced some of the reindeer Chukchi near the Kolyma to forego their importunities for gifts, in consequence of which the annual tribute was reduced to one ruble per adult man, amounting to 247 rubles from a population of 3000.

The other half of the reindeer Chukchi and the coast people pay no tribute, and are independent of their western neighbors. From the first the Russian authorities sought reliable and prominent men whom they could make chiefs; but their efforts were generally fruitless, as the Chukchi would not recognize such leaders. Old deeds in the archives of Kolyma mention several chieftains of this sort to whom their compatriots mockingly gave the surname Yī'ñītcîn, the "Long-nosed," i. e., those who poked their noses into affairs without authority.

Baron von Maydell, when imposing tribute on the reindeer Chukchi, conceived the idea of erecting a hierarchy, the head of which should assume the title of the so-called chief *toyon*[1] of the reindeer Chukchi and be known to the Russians as the Chukchi "king." This idea is now a subject of ridicule. In some years eight chieftains are elected; in others only three or four. Many people assessed by Maydell have since died, and their children refuse to pay the tribute. Since the *yassak* is very small, and inasmuch as the chieftains are usually selected by the authorities from the owners of the largest flocks, these chiefs ungrudgingly pay the tribute of those who refuse. Most of the money is paid by the men who live on the great tundra west of the Kolyma and in the mountains south of Omolon river, for this area has been occupied by Chukchi only a few years, and they consider the payment to be a tribute for their lands.

[1] A Turkish word for "lord" used throughout Siberia for the native chiefs.

Tribal divisions.—The Chukchi tribe may be divided into two groups — the reindeer Chukchi and the maritime Chukchi — together numbering some 15,000 according to the latest census by Mr Gondatti and myself. The Kolyma district contains not more than 3000 Chukchi, all of them possessing reindeer herds. The maritime Chukchi inhabit the Arctic coast from Cape Erri to East cape; on the Pacific coast they are intermixed with the Asiatic Eskimo.

Both branches of the Chukchi speak the same language, and although living quite differently are so intermixed as to be practically one people. Nevertheless, their folklore furnishes reason for supposing the existence of two tribal sources, unlike both in physical type and in culture, and which are represented as hostile to each other. One of the tribal nuclei appear to have been wanderers on the tundra and breeders of reindeer; the other settled on the coast which they navigated in long canoes quite unknown to the inlanders.

The Russian name Chukchi, or Chukchee, is derived from the Chukchi word *Cháwtcy*, which signifies "rich in reindeers." The reindeer people assumed this name in contradistinction to the coast dwellers, who are called Aňkalît ("Sea people"). Those who go back and forth between the coast villages and the camps of the reindeer-breeders are commonly called Kavrálît ("Rangers"). They are numerous and maintain control of the trade. The Russians generally call them Cape Chukchi, although most of them come from villages nearer than East cape. Usually the Chukchi call themselves simply Oráwêtlat ("Men"), or Lie-oráwêtlat ("Genuine men"), regarding all foreigners to be like devils (*kĕ'lat*).

Food.—The maritime Chukchi subsist by hunting sea-animals and by fishing. Notwithstanding the abundance of game and fish, their sustenance is far from assured, since they have to provide for their dogs, on which they depend for transportation, the same food as for themselves. A full team of twelve dogs

will consume twice as much food as an ordinary human family; besides, several puppies must be raised to take the place of the old or worn-out dogs. In addition to the food, there must also be obtained fuel for cooking it. This must be either seal or whale blubber, since all along the coast between Cape Erri and East cape driftwood is very scarce, and there is no standing timber. When the hunt has been successful, the maritime inhabitants, in the words of an ancient tale, "eat so much blubber that it trickles down both sides of their faces"; but when no game is taken the people often starve to death. The tales of the maritime Chukchi contain many direful details of such famines, which occur usually during heavy snowstorms when every living thing is deeply buried. Many of these tales relate how the inhabitants, having plenty when a storm began, afterward became short of provisions, and not being able to replenish the supply, famished. They first ate their dogs, then the skins, and finally began to gnaw their own hands.

The reindeer.—The greater part of the Chukchi gain their livelihood by reindeer-breeding, by which means existence is far less hazardous. There are many peculiarities of reindeer-breeding among the Chukchi not found elsewhere. Those about the dividing line of the continents have been more successful in reindeer-breeding, in point of numbers, than in all Asia; but in taming the reindeer they are far less successful than their neighbors, and their herds can scarcely be called domestic animals, since they are very shy and on the slightest provocation become as wild as any untamed beasts. Their hedging of half-wild reindeer is the same as that adopted preliminary to breeding any kind of cattle. The Chukchi herdsman must give his entire attention to keeping his flocks together. If he should become overworked and relax his attention, the flock will go astray, and after a few days of independence they become lost forever. There have been cases in which herdsmen fell asleep near their herds and on awaking could find no trace of them. I was informed of a family on

Chaun river, who in a single summer lost nearly all their animals, and in despair took their own lives.

In the summer of 1895, on the shore of the small river Molónda, in the Stanovoi mountains, we tended the herd of Sava, one of the wealthiest young reindeer herdsmen in that section. The animals were very restless; nearly every week half the flock would wander off, usually to the opposite side of the river. We could not follow them thither as the Molónda has a swift current, and at that time the stream was very high. The Lamut swam to the opposite bank on the back of a tall, gaunt courser, but when one of our herders, E'tuwhi, a heavy-weight, tried to follow, he was thrown in midstream and saved only with difficulty.

Every summer the reindeer Chukchi, in order that their herds may not become infested with insects, cross the tundra to the coast, where the ice-floes, drifted thither by the north winds, make the air cool. Others go inland to the glaciers near the sources of the small rivers. Early in autumn most of the herdsmen return with their herds to the shelter of the woods. The extent of these wanderings is not very great—only from 150 to 200 miles—but the Chukchi travel slowly and make frequent stops, so that these trips consume nearly nine months of the year. In summer all travel is suspended, the Chukchi reindeer being too small and weak to be used; therefore, as the large herds require frequent change of pasture, the herdsmen, as soon as the camp is settled for the season and a number of bucks sufficient for the needs of the family have been killed, drive their herds to pasture and wander with the reindeer for three months, without huts or other shelter, carrying their provisions and spare clothing on their backs, and living practically the same life as their animals. Every two or three weeks they return to their families to see that they are not in need of food, and in case of want they will carry to camp, on their own shoulders, the freshly-slaughtered animals. They could not drive their herds close to the camp in summer, since the

neighboring pasture lands must be kept for the August holidays. These cover several days, when many animals are slain, and the winter clothing is made from the reindeer-skins. Sometimes in midsummer, when the herds wander far, the people in camp are obliged to live for several days on berries, roots, leaves, and the like, mixed with stale reindeer blood, and often suffer hunger. The herdsmen kill few animals for their own use, as it is difficult to transport the meat; besides, in early summer the skins are too thin and full of holes to be of service.

Every summer a hoof-swelling malady ravages the flocks, and this is another reason why the herdsmen, knowing their herds will be decimated, are loath to slaughter them. To appease their hunger they suck the milk from the cows, or chip off a part of the new antlers of an old, heavy-headed buck, eating the thick gristle full of blood and covered with hair, which must be singed. Notwithstanding their scant diet, the herdsmen must exercise the utmost vigilance, sleeping but little for days at a time, as the reindeer-fly makes the reindeer restless and persistent in their efforts to get away.

During the dry, hot summer the strongest men become thin and weak; their eyes are inflamed, and the skin of their faces is burned almost like leather. The Chukchi know of no remedy for the maladies with which the reindeer become afflicted. They skin the carcasses and carry the flesh to camp when not too far. By reason of the scarcity of wood on the tundra, they build no pens or fences for their herds, but have to run about constantly after the fashion of a common shepherd dog.

On the whole their half-wild animals make but indifferent teams. Those bred by the Lamut usually command a double price, which is willingly paid by the Chukchi. If the reindeer herds of the Chukchi are increasing, it is due to constant exertion in keeping them together and to their frugality in the use of the flesh. The Chukchi housewife knows better than the women of the neighboring tribes how to obtain from a carcass the most

nutritious parts. The flesh and blood, the rims of the horns and hoofs, the gristle of the ears and nostrils are all consumed, raw or cooked. The half-digested moss taken from the paunch is cooked with fat and roots as a porridge; the bones are boiled to extract the marrow, and the remainder is used for feeding the dogs.

The Lamut hunters and the Russo-Yukagir fishermen on the Kolyma are not so provident. When they have plenty of food they waste much of it and indulge in excesses with no heed for the future. The Chukchi pabulum also includes many edible roots, leaves, and vegetable products not raised by neighboring tribes. I once met in the camp of Kêñukêda, a wealthy reindeer-breeder, some Russian fishermen who had come from a neighboring village to buy reindeer. The host had just returned from his herd, and instead of meat he was given to eat porridge made from willow-root bark cooked with sour liver from the summer supplies. The Russians regarded the repast with obvious disgust. At last one of them sneered: "Ah, Kêñukêda, you must have a capacious throat; even the wood slips down!"

"Aye!" answered Kêñukêda, quite unaffectedly, "my throat is indeed large, but I don't need to come to you for food!"

Physical characteristics.—Regarding the physical type of the Chukchi, without the presentation of anthropometric data at this time, it is possible to make only the following general remarks:

The Chukchi, as a rule, are tall and well built, especially when compared with their nearest neighbors, the lean and under-sized Lamut. Their cheekbones are much less prominent than those of the Tungus or Yakut, and the nose is smaller. Their eyes are brown in color, straight, and are frequently as large as those of the white race. Their hair is black and sometimes wavy, or indeed curly, a characteristic which I never found among the Lamut, and only among the Yakut of pure blood. It becomes gray much later in life than among the Caucasians. The beard is scanty, but is seen more frequently than among the Lamut or the Yakut. The eyebrows are often thick and shaggy, especially among the old men.

In this connection I would say that one of the requisites for beauty in a woman is heavy eyebrows.

The gray, sallow color of the skin of the face, common among the Lamut and Yukagir, is seldom seen among the Chukchi. This may be due to the superior diet of the latter. The color of the face is bronze, with intermediate tints varying from brick-red to blood-red. The ideal of beauty in both males and females requires the face to be as "red as blood, burning like fire." The color of the skin of the body is generally scarcely distinguishable from that of the Caucasian; however, there are numerous cases of brown or even of dark bronze skins.

Many Chukchi faces are rather clumsy in outline, with forehead low and straight, skull flattened, lower jaw massive, and the lower part of the face disproportionately large and strong; therefore a handsome head is frequently compared to a round, mossy hillock. One of the marks of superiority is the ability to eat quickly. "When the young men eat quickly the old men look on with pleasure," says the proverb. Faces strongly Mongol in outline are more frequent among the women, though many of them are as fair and well shaped as any woman of the white race.

Health. — The Chukchi are the healthiest of the tribes of the Kolyma country. Their women are free from that form of arctic hysteria which besets almost all Yukagir and Lamut women. Of contagious diseases, now, as formerly, the most dreaded is smallpox, which in 1884 destroyed more than one-third of the population. Some forty years ago syphilis, too, was much dreaded. The Chukchi regard it as indigenous, though its name, *átal-vâ'rghîn*, suggests the name of a tribe (*Átal*, Russian, Chuvanzi) who were mediators between the Russians and the Chukchi. However this may be, one afflicted with syphilis was regarded as an outcast. At home he was provided with bedding of his own, a separate dish and bowl, and was kept aloof lest others should contract the disease. Nowadays, since the decrease of the disease, these precautions are not maintained.

Another contagious disease, somewhat akin to influenza, now and then spreads through the country, from the Russian villages eastward, carrying away scores.

In spite of all this the reindeer Chukchi have increased steadily during the last half-century. Their families are large, one mother often having as many as ten children. The men live to old age, and often a white-haired man has a young bride with whom he rears a large family. These wild tribes are like squirrels in the wood or foxes on the tundra; they thrive and increase until ravaged by hunger or disease.

Mental character.—Opinions as to the mental character of the Chukchi vary according to the personality of the observer. To me their most conspicuous trait is their irascibility, of which they themselves are not unconscious.

"I am a tundra wanderer!" one of my Chukchi acquaintances, named Nhirô'n, would say to me. "My anger rises suddenly; it comes and goes of its own will."

The Chukchi in anger growls and shows his teeth, and even threateningly bites his sleeve or the handle of his knife, as if defying his foe. Some of them, when angered, shed tears and tear their hair like unruly children, and, when unable to take revenge, even commit suicide. They resent any assertion of authority against their will. This aversion to submission constantly breaks out in the family and among the clan-ties—even wives against their husbands and children against their parents. In the time of the wars with the Russians it impelled captives to take their own lives and made the free willing, in case of defeat, to leave their own country and emigrate to America.

Sophiology. — The Chukchi have a wealth of folklore and tradition, some of their tales being so long as to consume a whole night in the telling. In their own way they are eloquent. The character of their folklore is quite different from that of some of the Ural-Altaic people, and, in common with the folklore of the Yukagir, Kamchadal, and probably also the Koryak, presents

many points of resemblance to that of North America, especially of the North Pacific coast tribes. A collection of about one hundred and ninety of my Chukchi tales is now being printed by the Academy of Sciences of St Petersburg, hence I can only barely allude to the subject here. For instance, in the cosmogonic legends the raven acts the same part as in North American lore. He is the creator of the world and of man; he brings light — the sun, the moon, and the stars, — he makes lakes and rivers, and inhabits the earth with animals, etc. After his work is done he becomes a thunder-bird and lives in the sky surrounded by clouds.

Some of the Eskimo tales in Rink's collection are also known among the Chukchi. This is not surprising, since the latter are fond of the tales of other people, and have appropriated many Russian stories, adapting them, not without skill, to their own mode of life. I have listened to tales purporting to have been of American origin, as if they had been learned from American whalers, although I could not have told as much from their theme.

Like many primitive tribes, the Chukchi have developed a system of rites much more fully than that of creeds. The holidays of the reindeer Chukchi form a complete cycle, beginning with the autumnal feast of "slaying the thin-haired reindeer" and ending late in the spring with the "feast of antlers." All these feasts are accompanied with offerings in the form of sacrifice of reindeer, dogs, and small symbolic figures made of tallow, pounded meat, ground edible leaves, and even of snow and clay, all of which are regarded as substitutes for the real animal. Besides fat, flesh, and blood in the uncooked state, women prepare for sacrifice a porridge of blood mixed with fat and various edible roots. This is one of the most savory dishes prepared by the Chukchi.

In addition to the above, the following rites and sacrifices are included in the cycle:

1. *Enanʰadwkwurghîn*, feeding (of the hearth).

2. *Enattcî'irghîn*, a ceremony of thanksgiving over the larger animals killed in hunting.

3. *Enapyerâtirghîn*, commemorative of the dead.

4. Rites performed in accordance with a vow. Of these there are two groups: (a) *Mnhêʻirghîn*, ceremonials by vow; (b) *Erâir-ghîn*, racing for a prize.

The last two classes are the most important, since they are regarded as a safeguard against supernatural evils, and are arranged by promise, or under the influence of some dream, or at the behest of a shaman having the gift of prophecy. *Mnhêʻir-ghîn* is a particular kind of sacrifice, accompanied by drumming, ritualistic singing, dancing, etc. Sledge-racing is likewise attended with sacrifices and also has a ritualistic meaning. Racing is a social festival which attracts the whole population of the nearest camps, and is accompanied with foot-running for prizes, wrestling, and other feats.

Mortuary customs.—The mortuary rites of the Chukchi are of great interest. In disposing of their dead they either burn them or leave them in the open field wrapped in large slices of reindeer flesh. The manner is regulated by family tradition, which descends from father to son. Soon after death the body is stripped, placed in the inner sleeping-room, and carefully covered with reindeer-skins, since it is thought to be a sin "to show any part of the corpse to the sun or to a strange eye." One of the nearest relations of the deceased must pass the first night in the sleeping-room, watching the body. In the morning four other relations come to dress, before doing which they share with the dead the last meal. It was once my lot to share a meal of this sort in a room so narrow that we had scarcely room to sit with the corpse. For lack of space we put our dinner-board on the dead man, placing thereon our cups, teapots, and trays laden with meat. We sat leaning our elbows over the body, and since I was at the upper end, my elbow was directly over the head. In the board against the mouth they cut a hole, and on me devolved the duty of feeding the dead, pouring hot tea into the hole and slipping through it morsels of tallow. When the meal was finished, all

the men stripped themselves to their inner skin shirt; then raising the corpse slightly, they thrust their bare feet under the nude body, and, resting it on their crossed legs, began to put on it new clothes made for the purpose. When the corpse was dressed, the face was covered with the hood of the outer cloak which, tied with a freshly-cut thong, was wound around the whole body from the head downward. They then pushed the corpse out to begin the divination.

This divination is performed by near relations of the deceased with the aid of the staff or of the crooked wand of horn used for beating the snow from fur clothing. The staff or wand is tied to the thong binding the head, and the divinator, holding with his hands the opposite point, asks a question and strives to lift the body. If the answer is in the negative, the corpse is supposed not to allow its head to be lifted; if, on the contrary, the answer is an affirmative one, the head is lifted without effort. In this manner the dead is questioned as to the spot where it desires to be placed, about the leader of the funeral procession, the reindeer-team for its funeral sledge, etc. In the same way it is questioned about the future of those living, about the diseases likely to attack them, and as to their success in hunting, trading, etc. After the divination the corpse is tied lengthwise on the sledge, a reindeer team is harnessed, and the leader sits astride the body, taking the reins in his hands.

The Chukchi sledge must be used with the legs dangling on both sides. When the place of deposit is reached the reindeer are slain. Some of the followers untie the corpse and place it on the spot designated, while others cut off the reindeer flesh in thin, broad slices. When enough flesh has been cut off, they begin to cut the clothes of the dead, exchanging for every piece a slice of flesh until the body is entirely covered with it. Then the nearest kinsman cuts the throat and opens the breast in order to lay bare a part of the heart and the liver. This operation is performed with gloved hands, since the dead body is reputed to be unclean

and must not be touched with bare hands. The corpse is then left to the ravages of wolves and foxes; and the sooner it is consumed the better it is supposed to be for those living.

When burning is resorted to the corpse need not be covered with reindeer flesh, but is put on the pile with the clothes on and tied around with the thong. On the tundra, when there is no standing timber within reach and driftwood is scarce, the sledges and tent-poles are sometimes cut up for the pyre.

Divination.—Divination for deciding as to the moving of a camp and herd, and for undertaking journeys, is frequently effected by a burnt reindeer shoulder-blade, or by suspending the thing most often used. When the object hung is heavy, it is let down on the ground and the answers of the oracle are interpreted as in the ceremony for the dead: when the answer is negative, the article cannot be lifted; when it is in the affirmative, it is easily lifted. In divination with a light object it is held up, and when the article remains still the answer is in the negative, but should it swing, the answer is affirmative.

A feature of all rites is the so-called *êlŏ'tko-vâirghîn* ("the exercise on the drum"), which is in the nature of shamanistic practice and gives weight to the idea that this or that individual has shamanistic power. Every one, male and female alike, has the right, and on some holidays is duty bound to share in this exercise on the drum. The exercises are accompanied with the ritual dance and the singing of airs, some of which are inherited while others are composed for the occasion or improvised.

Sacred objects.—The idea of sacredness attached to the hearth and to many household implements, such as wooden fire-making tools rudely carved in the form of idols (*ghî'rghir*), and to small wooden amulets (*táiñīkwut*), originated in their system of rites. Family drums are also sacred; they descend by inheritance and must not be given to strangers; they are supposed to protect the well-being of the family, and play a part in all rites and on all holidays. In the principal yearly feast—the slaying of the thin-

haired reindeer—the ceremony is accompanied by anointing the reindeer with the blood of sacrifice. In this ceremony all the family paint their faces with certain inherited signs which are different for each family.

Taboo.—Every family is hampered by prohibitions, the most important being the taboo of interchange of fire (even of partly burnt fuel), which causes much inconvenience on the cold and timberless tundra. It is worthy of note, however, that no such taboo is recognized in their relations with neighboring peoples. The fire of a Russian neighbor or guest, for instance, may be borrowed by any Chukchi without fear. In personal intercourse, such as lighting a pipe, a Chukchi may freely use fire obtained from matches or by flint-and-steel. Only the sacred household fire, obtained from wooden fire-making implements, and which is indispensable at feasts and on holidays, must be absolutely free from contact with another fire derived from similar means.

Generally the fire of a strange family is regarded as infectious and as harboring evil spirits. Fear of pollution extends also to all objects belonging to a strange hearth, to the skins of the tent and the sleeping-room, and even to the keepers and worshippers of strange penates. The Chukchi from far inland, who travel but little, when they come to a strange territory fear to sleep in tents or to eat meat cooked on a strange fire, preferring to sleep in the open air and to subsist on their own scant food supply. On the other hand, an unknown traveler, coming unexpectedly to a Chukchi camp, can hardly gain admittance to a tent, as I myself have experienced.

Animism and spiritism.—Many details of the rites and feasts vary in different families, and are performed with the utmost care and secrecy. The animistic conception of the outer world is generally recognized. All objects retaining their natural properties and much of their natural shape, but assuming also the shape of human beings, are thought to possess animate power. Thus the personified "People of Wood" (*Úttî-rĕ'mkîn*) fear the fire, for it

could burn them; while the "Tallow People" live on the bottom of the stone lamp, etc. This concept coincides with the Yukagir notion of indwelling spirits ("owners"), resembling human beings, filling the outer world. Such, for example, are the owners of the woods, the rivers, the mountains, etc.

The conception of evil spirits (*kĕ'lat*), wandering unseen about the earth, is also extensively developed; all misfortunes and maladies, even death, are ascribed to them. They come from under the ground, or from the extreme limits of the Chukchi country, for the sole purpose of harming men, and having accomplished their purpose they pass on. Sacrifices are rarely made to them, except by wicked shamans. Protection against these evil spirits can be gained only from right-minded shamans, who can foretell their attacks and advise measures for rendering them ineffective.

The *kĕ'lat*, when attacking man, first tries to get his soul and eat it. Every man has from five to six souls, or even more. These souls (*uvī'rīt*) are very small—not larger than a gnat. Everybody can lose one or even two of the *uvī'rīt* without endangering his health, but if he loses too many, illness ensues. On the other hand the shaman can cure a man who has lost all his souls by blowing into him some part of his own spirit or by replacing the soul with any of the *kĕ'lat* dependent on himself.

The conception of a general divine force is very indefinite and is termed *Nhárhînên* (World), *Uĕ'ubechu-wâîrghîn* (Merciful Being), *Tînantúmghî* (Creator), etc. The Creator is represented as living on top of the sky. Some traditions give him the name of the "Owner-of-the-star-with-the-stuck-snake" (*Unp-ĕ'ñêr*), a term applied generally thoughout Asia to the polar star, signifying that it is fixed and in the middle of the sky.

Shamanism.—Sexual transformation.—Shamanistic powers are conferred at maturity. A young man, not having before shown any sign of singularity, suddenly becomes pensive; he may pass days and nights in the open air far from home, or, on the contrary,

he may sleep in the sleeping-room without ever going out. He refuses food and intercourse with men, and answers no questions. This critical condition, believed to be caused by the onset of the spirits on their chosen man, often ends in the sickness or death of the man "doomed to being shaman." The only means to be resorted to for recovery are drum-practice, performed by the "new-inspired" uninterruptedly for several weeks, together with singing and attempts at ventriloquism.

Then the young man doomed to sexual transformation receives a message to that effect from his spirits, and must at once don women's clothes, acquire a woman's voice, learn to perform women's work, and forget his former masculine knowledge. He must become very bashful, and, like a young girl, ashamed to look a stranger in the face. After this transformation he, or "she," looks about for a lover, in which she is aided by her protecting spirits, who cause the hearts of the young men to be drawn to her and inspire them with the passion of love. After a while the transformed is married, and lives during the rest of her life in the wedded state, performing of her own accord the duties of housewife. Such full transformations are not numerous. In a tribe of 2000 men I heard of only five cases. Instances of partial transformation, whereby the man, assuming female clothing and speech still can have a wife and beget children, are more numerous. Instances of the transformation of women into men are more rare.

All other Chukchi shamans may be divided into three groups. The first includes ventriloquists, who perform many tricks similar to those of spiritism. Implicit faith is not placed in all their arts, many of which are looked upon as mere amusements. The second group, the medicine-men ("knowing ones"), seek the destruction of the evil spell, or, on the contrary, its consummation. The third group, consisting of the prophets, occupy themselves with divination. These groups, however, are not clearly defined, for a shaman skilled in the practices of one has generally a knowledge of the others.

XUM

Chukchi shamans use the common family drum and wear ordinary clothes, sometimes crudely ornamented along the skirt and around the wrists with many amulets and thickly-sewn fringe. They perform their tasks in utter darkness, in the inner sleeping-room and in an almost naked condition. The shaman sits in the place of honor in the left inner corner, but is cramped for space since the room is small. The performance consists of a series of all sorts of sounds, the performer, by deflecting the sound, producing strange effects with his drum, and throwing his voice, with varying force, in all directions. The sounds rush through the room like a storm. The spirits talk on all sides; they quarrel among themselves and attack the shaman and the assistants. Once in a performance of this sort, Kôpô'whê, the celebrated shaman of Anuy river, made the spirits, at my request, speak close to my ear, and the illusion was so complete that I involuntarily held up my hand to catch the voice. These spirits, coming at the call of shamans, have the name of *kĕ'lat*, but are not the same as the evil *kĕ'lat*—the malady-makers. These *kĕ'lat* are not harmful; they represent objects in nature, taking their names, as *Ilwî'lu-kĕ'la* (Wild-reindeer spirit), *Nhaw-ri'rka-kĕ'la* (She-walrus spirit), *Chĕ'yvulêgay* (the Walking One, i. e., the Bear), *Iwchuwghi* (the Long One, i. e., the Needle), *Pilvî'nte-pnáwkwun* (the File), etc.

The shamanistic songs are varied and have some beauty, though they sound oddly to a European. A shaman will sing and drum for several hours without sign of fatigue, as if he were buoyed up by the spirits who sang and performed in his stead.

Astronomic lore.—Many tales are associated with the Chukchi constellations: Arcturus and Vega are named "two brother heads," the foremost head and the hindmost head. They wander over the sky, following each other with a long row of loaded sledges. The foremost head is called "the herd of the stars" and "the herd of the upper reindeer flocks." Orion is an archer (*Chultĕ'nnin*), aiming with his bow at a group of women

(Pleiads), each of whom refuses to marry him, on account of the size of his virile member, which is represented by three stars extending downward. Chultê′nnin has another wife (Leo), but they quarreled and she struck him with a tailoring board, causing his back to become crooked; therefore he repulsed the woman, who, being tired, fell asleep in the middle of the sky, her head resting on her right sleeve. Aldebaran is an arrow of the Chultê′nnin stuck in the bog represented by numerous small stars. The Milky Way is a river with sandy banks and many isles; in the middle of it stand five wild reindeer bucks (Cassiopeia). Ursa Major represents six warriors armed with slings, the seventh double star being a gray fox gnawing a pair of reindeer antlers. Corona Borealis is a polar-bear's paw. Shooting stars are said to slide down ice-hills. Comets are called "smoking stars," the smoke indicating that much cooking is being done.

The Chukchi have eight seasons in their year, twenty points of the compass, and three shortest days in winter.

Social organization.—Among these people the strongest social relation is the family tie, which is broadened to include the clan. Nearest male relations form a union pledged to assist one another. This union is cemented by the community of fire, by consanguinity (which is admitted for the male side), by the identity of the signs painted on the face with the blood of sacrifice, and by hereditary ritual songs.

Members of the same kin roam over the same territory and maintain intercourse between themselves. If one loses his herd, richer kinsmen will replenish his stock. Marriages are usually restricted to their own kindred. Journeys to Russian block-houses or trips to the seaboard for purposes of trade are undertaken by one or more members, who take with them skins and furs for which they trade tobacco, hardware, walrus skins, and ground-seal thongs. These articles are divided among the kindred according to the respective number of skins traded, but whenever any one is without tobacco or thongs, he can take from

those who have them. An offense committed against any member of the kindred is speedily avenged. A Chukchi proverb says: "A man rich in brothers is prone to violence; the brotherless is timid." However, this close tie is kept up only by cousins; the third generation is bound much more loosely, and after removal to another territory the bond is soon forgotten. The hereditary songs change so much as to be finally unrecognizable; the "halves of the same fire," burning apart and in a different environment become estranged, having to feed on different fuel, and forming a "smell and a breath of their own."

The union of Chukchi kinsfolk has no chiefs, no settled meetings, nor any organization. The kinsmen usually meet at the reindeer races, which are arranged at brief intervals by each man in turn. If there be some question of common concern it is talked over, although it is not always settled.

Marriage.—Marriage is contracted in different ways. Unions of couples closely related by blood are very common, and the bond is regarded as stronger than when the pair are not consanguineally related. In such cases no payment is made for the bride, but the family of the latter have a right to expect an equivalent from the groom's family, should they need it later. Children are often reared together with a view of future marriage. They sleep together from the beginning, and the marriage is consummated on the first impulse of nature, or even before maturity of either party. Such marriages are considered to be the strongest.

Another form of marriage is concluded between persons belonging to different family groups. In former times such a marriage required one of the parties to enter the family of the other, leaving forever his own kindred. Latterly, the length of this desertion has been restricted to one or two years, during which time the bridegroom must serve the family of the bride, his service being counted as ransom paid for the woman. A young man thus serving his father-in-law, as Jacob served Laban, has to perform all kinds of rough and hard work, and is usually tested by

various trials before the family of the bride allows him to lead her away. Rich families who, having many young women whom they are unwilling to give to strangers, generally select poor young men. These, having stood the test, are admitted to the bride and become members of the family by the performance of certain rites.

These latter forms of marriage are not very binding. The parents and brothers of the woman given away to the stranger reserve the right to take her back even after the lapse of years. I knew of a Chukchi, named Nhîrô′n, who was young but poor and profligate, and who gave his sister to another Chukchi, Ankánukwat, son of Táto. Instead of the required time of service, the bridegroom came to his brother-in-law, bringing his own large flock. He lived with his brother-in-law two years, during which time Nhîrô′n and his wife fed from the flock and squandered all that he could obtain, selling young and old bucks to the Russians, or gambling them away. At the end of the second year, Ankánukwat, whose patience was nearly exhausted, wandered off. For two years more Nhîrô′n profited from the same source, taking now a team, now skins to sell, or young animals to slaughter. Finally, Ankánukwat utterly lost patience and refused his brother-in-law's demands, whereupon the latter, having been playing cards for three days, went at once to Ankánukwat's camp and took his sister away, though she had been Ankánukwat's wife for four years. The husband did not care to quarrel, especially as he had no children; but pitying his wife, he followed her to Nhîrô′n's place and stayed there a week or two, hoping Nhîrô′n would relent. The latter, however, requested Ankánukwat to rejoin his camp, and not knowing what to do, Ankánukwat took counsel of his father. Meanwhile, Nhîrô′n took a hand at cards with a friend, and the divorce contest came to an unexpected conclusion. One of Nhîrô′n's neighbors, Mēwēt, having an old score to settle, came to the camp in Nhîrô′n's absence, and led the young woman, nothing loath, to his own home. Nhîrô′n was so enraged when he learned

of this that he immediately, at night and in a severe snow-storm, sought an encounter with his enemy. Two months later, when I was again in the vicinity, I found him with his family living at his new brother-in-law's and dissipating his large flock as well.

In the case of accepting a poor young man into the family, there have been instances where the father-in-law, becoming displeased, has suddenly sent the son away, although he may have been in the enjoyment of his nuptial rights for several years. In one such case the young man, rather than leave his wife, took both her life and his own.

Marriage by interchange is observed mostly between first and second cousins. Males entering into this bond acquire the mutual right to the wives of one another, a right which can be claimed at every meeting. Nowadays marriage by interchange can be contracted between unrelated parties — even with people of foreign tribes with whom close friendship has sprung up. A bachelor and a widower living in the same camp with a married man can form a like contract. This style of marriage is only a system of polyandry. Sometimes more than ten people may be affected by marriage through interchange within one group, although three or four are regarded as sufficient. Women generally are not averse to the custom; even Russian women married to the Chukchi of the tundra submit to the interchange method without protest, while, on the contrary, Chukchi women have been known to take their lives rather than submit to the demands of other men, even with their husbands' consent.

Chastity is not highly regarded. The Chukchi language has no distinctive term for "maiden," the word *yánvînháyĉ*, which is usually employed, referring to any woman without a husband, including widows and divorced women.

Polygamy is common, but the polygamist is generally contented with two wives, although the Chukchi chief Ēyhēlī, previously referred to, had four living wives besides four who were deceased. A rich Chukchi on Anuy river had seven wives; and

other examples might be mentioned. The first wife is held in greater esteem than the others and is termed the "elder wife" (*pēnīn nhēw*). The second wife can expect to win the favor of her husband only after she has given him several healthy children.

The reasons for polygamy differ in different cases. When an elder wife is childless, a second wife may be taken for the sake of offspring; or when the first wife loses vigor and has no grown daughters, the man may take a younger wife to assist in the household duties. Sometimes the second wife is taken at the request of the first, while at other times the second wife is regarded as a rival. When a rich man has two wives he usually divides his flock and makes for each wife a tent and provides for her support. The poor man lives with his two wives in one small tent.

Chukchi men have no hesitancy in marrying stranger women — Russian, Lamut, and Tungusian,— paying for them high prices. In cases of marriages within the tribe no price is paid in skins, deer, or other valuables, and they ridicule their neighbors "who take payment for a girl as for a reindeer cow."

The marriage rite is very simple. Its chief feature consists of anointing with the blood of a reindeer slain for the purpose. The bride and bridegroom, with other members of his family, paint on her face the hereditary signs of her new family by which she casts off her old family gods and assumes the new ones. When the bridegroom is taken to the family of his father-in-law, his family totem marks and gods are discarded and he paints on his face the totem of the family to which he will henceforth belong.

Status of women.—The status of women is rather low. They must perform much hard and dirty work, for nearly all domestic occupations — the preparation of food, making of clothing, pitching and striking of the tent, and the bringing of wood—are undertaken by them; besides, the younger women, if not burdened with an infant, help their husbands to herd the flocks.

According to a Chukchi saying, "Woman is more thrifty than man in three particulars — getting children, preparing food, and watching the flocks."

In camp women prepare and serve the men their daily meals, while for themselves they are contented with the leavings. During the evening the women are busy in the outer room while the men idle away the time in the sleeping-room awaiting supper. The housewife comes inside only after the meal is over and in order to put away the dishes. Then she can go to bed.

Children.—The Chukchi families are rich in children, of whom the parents are very fond. When ten years of age the boy, and often the girl, are sent to watch the flocks. Half-grown boys are kept very strictly; they are badly and scantily fed, are not always allowed to sleep in the tent, and are compelled to do the larger part of the herding. Meanwhile the father has more leisure and visits the flock only in bad weather or in the mosquito season, when the reindeer become restless.

Treatment of the aged.—Voluntary death.—The custom of putting to death the aged and sick is due to the hard conditions of life in the arctic wilderness. It is also a part of the Chukchi system of ethics. The old and sick consider death a right, not a duty, and often claim this right notwithstanding the opposition of their kinsmen. The custom of voluntary death sometimes passes by inheritance, though it is not held to be irrevocable. If once a man expresses a desire to die in such manner, he has no right to turn back on account of the trouble that his change of mind may bring to his family. Such a man is considered to be a victim of the *kê'lat*, and no man has the right to take from them a promised sacrifice. For instance, if a herdsman, angered at his flocks for their restlessness, should say to them, "Let the wolves eat you," as is usual with the reindeer Chukchi, he is considered to have promised his entire flock to the *kê'lat*, to whom the wolves are said to be akin, and the promise must be redeemed by slaying several of his best animals.

Survival of vassalage.—Young members of poor families, usually from other tribes, help wealthy Chukchi reindeer-owners to herd their flocks, receiving in return food, clothing, and gifts of living animals. The conditions of such an agreement are uniformly fixed. The newcomer generally brings with him or obtains on the spot his tent, which is kept in order by his wife, mother, or sister, for without a woman's aid no genuine herder can long exist; he also brings or acquires a few team reindeer for transporting his domestic goods. The poor "neighbor-mate" (*nîmtumghîn*) is now simply a workman (*chawchuwáamó'lîn*), whereas in former times his first duty was to defend against hostile attacks, thus supporting what may be regarded as a system of vassalage. According to tradition there were formerly bondmen and bondwomen, acquired through captivity or by purchase. Now there are no slaves, but it is not unusual to hear people taunted on account of their descent from Koryak or Eskimo boys. But on the whole this "neighborhood tie" was never so strong that the bond could not be severed when occasion demanded.

Crime.—Murder or infringement upon rights and property is punished by vendetta, but if the wrong is done within the limits of the family, outsiders have no right to interfere. Thus crimes against near kinsmen, which are by no means rare among the Chukchi, remain unavenged. "We have done it among ourselves" was regarded as a sufficient explanation when Yî'ketî and Kóta cut their father's throat while in camp near Cape Erri in 1895. In the summer of 1896, on Poplar river, southward from the Little Anuy, in the Kolyma country, a young man killed his brother in order to get possession of his flock. The murderer, with his accomplice, named Kôntî'irghîn, and their victim, arranged a contest of springing over a barrier, the loser to pay his fine by making several springs with his feet bound together. When the elder brother lost, the murderer and his accomplice performed their foul deed. The fratricide took the flock and went unpunished. Kôntî'irghîn related this story to me in the midst of a

group of listeners gathered in the tent of a wealthy and respectable reindeer-breeder named Lame (Ghaghánto). Here Kônti'îrghîn lived as an aspirant for Lame's elder daughter. None of the listeners showed any signs of disapprobation, but on the morrow, when one of the sons of Ghaghánto let his knife fall in Kônti'îrghîn's presence, my fellow traveler, pointing out the young man, shouted: "Don't let your knife fall near him; he will seize it and kill you as he did another!" Kôntî'îrghîn reddened but made no reply. Ghaghánto afterward told me in confidence that Kôntî'îrghîn had no reason to remain longer in his camp, since he did not desire a murderer for a son-in-law; but even then I was not sure whether the cunning old man was sincere in his disapproval or whether he was trying to appear civilized.

The vendetta can be bought off with sufficient ransom. In the spring of 1895, when, during a brawl at the Anuy fair, a Chukchi was killed, a kinsman in my presence insisted that one of the Cossacks participating in the murder should be given to them to take care of the wife and children of the deceased. In former times a man taken as ransom would be enslaved, at least for a time; but in this case the Cossack was bought off with brick-tea, tobacco, and sugar. Nevertheless, the Chukchi made wry faces, and we feared they would attack our small wooden fort. Most of the people were concerned with trade rather than with the life of an individual, so the fair went on and ended in the usual way. Six months later, however, when traveling along Wolverine river, in the country of the upper Anuy, I was compelled to face the ill-will of people with whom I had been on friendly terms for two years, and to the very last some of my followers were robbed and we nearly came to blows on account of this difficulty.

THE TECHNIC OF ABORIGINAL AMERICAN BASKETRY

By OTIS T. MASON

Basketry is one of the textile industries. It is differentiated from network and loom products by the fact that its materials are usually rigid. However, no wide gulf separates the different varieties of textiles, basketry merging on the one side into lace work and on the other into bagging and other soft fabrics, its own types and classes also being often associated in the same example. In form, basketry varies through the following classes of objects:

1. Flat mats or wallets, generally flexible.

2. Plaques or food plates, which are slightly concave.

3. Bowls for mush and other foods, and for ceremonial purposes, hemispherical in general outline.

4. Pots for cooking, with cylindrical sides and rounded bottoms.

5. Jars and fanciful shapes, in which the mouth is constricted, frequently very small, and now and then supplied with covers. The influence of civilization in giving modern shapes to basketry has not been beneficial to this class of forms.

There are two distinct types of basketry, namely, (I) *hand-woven* or *plicated* basketry, which is built on a warp foundation, and (II) sewed or wrapped basketry, which is built on a coiled foundation of rods, splints, or straws, and is called *coiled* basketry.

I.—Kinds of Woven Basketry

Woven or plicated basketry may be divided into several kinds or subvarieties. It is to be understood that no loom is ever used in basketwork. Matting is frequently made over a bar, and soft wallets require a framework to hold the warp, but in basket-

making all the insertion of weft or filling is done with the fingers, as in plaiting or braiding.

a. Checkerwork.—This occurs in the bottoms of many North Pacific Coast examples and also in the work of eastern Canadian tribes (figure 9). In this ware the warp and the weft have the same width, thickness, and pliability. It is impossible, therefore, in looking at the bottoms of the cedar-bark baskets and the matting of British Columbia (figure 10) or eastern Canada, to tell which is warp and which is weft. Indeed, in very many examples the

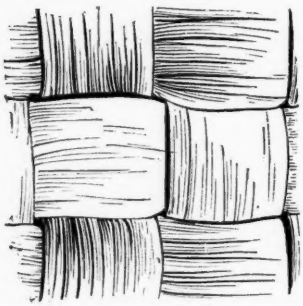


FIG. 9—Plain checker weaving in basketry with hard material.

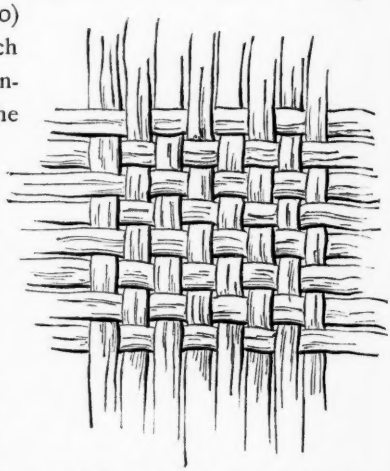


FIG. 10—Plain checker weaving in basketry with bast or other soft material.

warp and weft of a checker bottom are turned up at right angles to form the warp of the sides, which may be wicker or twined work. A great deal of bark matting is made in this same checker-work, but the patterns run obliquely to the axis of the fabric, giving the appearance of diagonal weaving. When warp and weft are fine yarn or threads, the result is the simplest form of cloth in cotton, linen, piña fiber, or wool. The cheap fabrics of commerce are of this species of weaving. In art, latticework frequently shows the bars intertwined as in checker basketry.

b. Diagonal or twilled basketry.—This is seen in those parts of the world where cane abounds. In America it is common in

British Columbia, Washington, southern United States, Mexico, and Central America, and of excellent workmanship in Guiana and Ecuador. The fundamental technic of diagonal basketry is in passing each element of the weft over two or more warp elements, thus producing either diagonal or twilled, or, in the best examples, an endless variety of diaper patterns (figure 11).

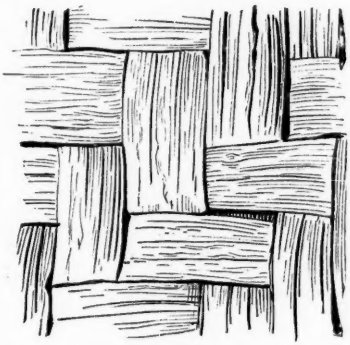


FIG. 11—Diagonal or twilled weaving in basketry with flat, ribbon-like elements.

Excellent effects are produced in this kind of weaving by means of color. Almost any textile plant, when split, has two colors: that of the outer or bark surface, and that of the interior woody surface or pith. Also, the different plants used in diagonal basketry have great variety of color. By the skilful manipulation of the two sides of a splint, or by using plants of different species, geometric patterns, frets, labyrinths, and other designs in straight-line are possible. Examples of matting from the nitrous caves and modern pieces from the Cherokee — both in matting and basketry — are double. By

FIG 12 Wickerwork or wicker weaving in basketry, in round stems.

this means both the inside and the outside of the texture expose the glossy outer silicious surface of the cane.

c. Wickerwork.—This is common in eastern Canada; it is unknown on the Pacific coast and Interior basin, excepting in one or two pueblos, but is seen abundantly in southern Mexico and Central America. It consists of a wide or a thick and inflexible warp, and a slender flexible weft (figure 12). The weaving is plain and differs from checkerwork only in the fact that one of the elements is rigid. The effect on the surface is a series of ridges. It is possible also to produce diagonal effects in this type of weaving.

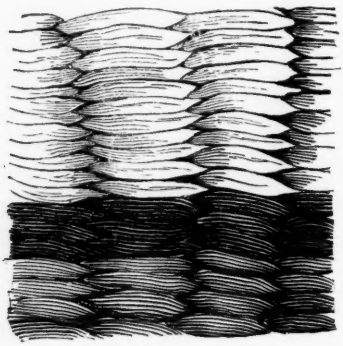


FIG. 13—Close wickerwork on Hopi plaque, the warp hidden.

The finest specimens of wickerwork in America are the very pretty Hopi plaques made of *Bigelovia graveolens.* Short stems are dyed in various colors, worked into the warp, and driven tightly home so as to hide the ends and also the manner of weaving (figure 13). Various patterns are effected on the surface—clouds, mythical birds, and symbols connected with worship. It has passed into modern industry through the cultivation of osiers, rattan, and such plants, for market-baskets, covers for glass bottles, and in ribbed cloth, wherein a flexible weft is worked on a rigid warp.

d. Twined or wattled basketry.—This is found in ancient mounds of Mississippi valley, in bagging of the Rocky mountains, and all down the Pacific coast from the island of Attu, the most westerly of the Aleutian chain, to the borders of Mexico. It is the most elegant and intricate of all in the woven or plicated species. Twined work has a set of warp-rods or rigid elements, as in wickerwork; but the weft elements are commonly adminis-

tered in pairs, though in three-ply twining and in braid twining three weft elements are employed. In passing from warp to warp these elements are twisted in half-turns on each other so as to form a two-ply or three-ply twine or braid. According to the relation of these weft elements to one another and to the warp, different structures result as follows:

1. Plain twined weaving, over single warps.

2. Diagonal twined weaving or twill, over two or more warps.

3. Wrapped twined weaving, or birdcage twine, in which one weft element remains rigid and the other is wrapped about the crossings.

4. Latticed twined weaving, *tee* or Hudson stitch, twined work around vertical warps crossed by horizontal weft element.

5. Three-ply twined weaving and braiding in several styles.

1. *Plain twined weaving.* — Plain twined weaving is a refined sort of wattling. The ancient engineers in America who built obstructions in streams to aid in catching or impounding fish, drove a row of sticks into the bottom of the stream, a few inches apart. Vines and brush were woven upon these upright sticks which served for warp. In passing each stake the two vines or pieces of brush made a half-turn on each other. This is a very primitive mode of weaving. Plain twined basketry is made on exactly the same plan: there is a set of warp elements which may be reeds, or splints, or string. The weft consists of two strips of root or other flexible material, and these are twisted as in forming a two-ply string passing over a warp stem at each half-turn (figure 14). Pleasing varieties of this plain twined weaving will be found in the Aleutian islands. The Aleuts frequently use for their warp, straws of wild rye or other grasses in which the straws are split and the two halves pass upward in zigzag form;

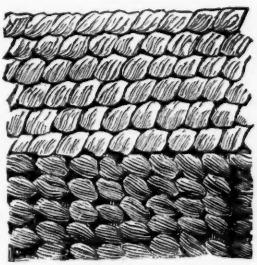


FIG. 14—Plain twined weaving in Nez Percé wallet.

each half of a straw is caught alternately with the other half of the same straw and with a half of the adjoining straw, making a series of triangular instead of rectangular spaces (figure 15).

A still further variation is given to plain twined ware by crossing the warps. In bamboo basketry of eastern Asia these crossed warps are also interlaced or held together by a horizontal strip of bamboo passing in and out as in ordinary weaving. In

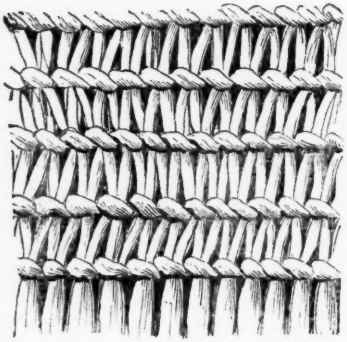


FIG. 15—Plain twined weft on zigzag warp in Aleut wallet.

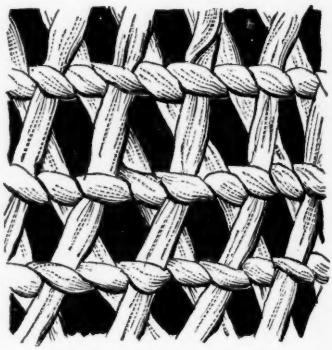


FIG. 16—Twined weaving on crossed warp.

such examples the interstices are triangular, but in the twined example here described (figure 16) the weaving passes across between the points where the warps intersect each other, leaving hexagonal interstices. This peculiar combination of plain twined weft and crossed warp has not a wide distribution in America, but examples are to be seen in southeastern Alaska and among relics found in Peruvian graves.

2. *Diagonal twined weaving.*—In diagonal twined weaving the twisting of the weft filaments is precisely the same as in plain twined weaving. The difference of the texture on the outside is caused by the manner in which the wefts cross the warps. This style abounds among the Ute Indians and the Apache, who dip the bottles made in this fashion into pitch and thus make a water-tight vessel, the open meshes receiving the pitch more freely.

The technic of diagonal twined weaving consists in passing over two or more warp elements at each half-turn; there must be an odd number of warps, for in the next round the same pairs of warps are not included in the half-turns. The ridges on the outside, therefore, are not vertical as in plain twined weaving, but pass diagonally over the surface, hence the name (figure 17). This method of manipulation lends itself to the most beautiful and delicate twined work of the Pomo Indians. Gift baskets, holding more than a bushel

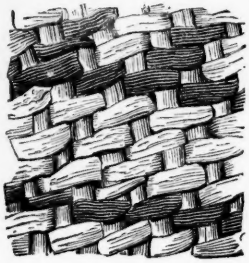


FIG. 17—Diagonal twined weaving, twilled patterns.

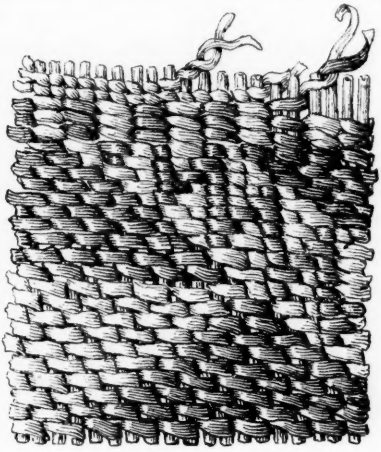


FIG. 18—Outside view of mixed twined weaving.

and requiring months of patient labor to construct, are thus woven. Figure 18 shows how, by varying the color of the weft splints and changing from diagonal to plain weaving, the artist is enabled to control absolutely the figure on the surface.

3. *Wrapped twined weaving.*—In wrapped twined weaving one element of the twine passes along horizontally across the warp stems, usually on the inside of the basket. The binding element of splint, or strip of bark, or string, is wrapped around the crossings of the horizontal element with the vertical warp (figure 19). On the outside of the basket the turns of the wrapping are oblique; on the inside they are vertical. It will be seen, on examining this figure, that one row inclines to the right, the one

above it to the left, and so on alternately. This was occasioned by the weaver's passing from side to side of the square carrying-basket, and not all the way round as usual. The work is similar to that in an old-fashioned birdcage where the upright and horizontal wires are held in place by a wrapping of finer soft wire. The typical example of this wrapped or birdcage twine is to be seen among the Indians of the Wakashan family living about Neah bay, Vancouver island, and southwestern British Columbia (figure 20).

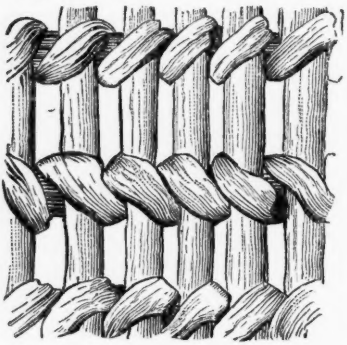


FIG. 19—Wrapped twined weaving or birdcage pattern.

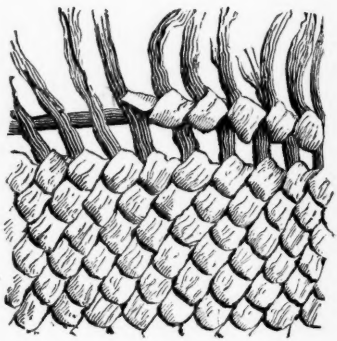


FIG. 20—Wrapped twined weaving or birdcage pattern in soft material.

In this type the warp and the horizontal strip behind the warp are both in soft cedar bark. The wrapping is done with a tough straw-colored grass. When the weaving is beaten home tight the surface is not unlike that of a fine tiled roof, the stitches overlying each other with perfect regularity.

Figure 21 shows a square inch of the inside of a basket with plain twined weaving in the two rows at the top; plain twined weaving in which each turn passes over two warp rods in four rows just below; in the middle of the figure, at the right side, it will be seen how the wrapped or birdcage twined work appears on the inside, and in the lower right-hand corner is the inside view of diagonal twined weaving. In the exquisite piece from which this drawing was made, the skilful woman has combined

four styles of two-ply twined weaving. On the outside of the basket these various methods stand for delicate patterns in color.

4. *Lattice twined weaving.*—The lattice twined weaving, so far as the collections of the United States National Museum show, is confined to the Pomo Indians, of the Kulanapan family, residing on Russian river, California. Dr Hudson calls this technic *tee*. This is a short and convenient word and may be used for a specific name. The *tee* twined weaving consists of four elements—(*a*) the upright warp of rods, (*b*) a horizontal warp crossing these at right angles, and (*c*, *d*) a regular plain twined weaving of two elements, holding the warps firmly together (figure 22). In all the examples in the National Museum the horizontal or extra warp is on the outside of the basket. On the outside the *tee* basketry does not resemble the ordinary twined work, but on the inside it is indistinguishable. Baskets made in this fashion are very rigid and strong, and frequently the hoppers of mills for grinding acorns, and also water-tight jars are thus constructed. The ornamentation is confined to narrow bands, the weaver being greatly restricted by the technic.

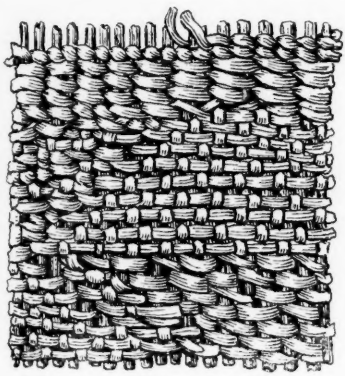


FIG. 21—Inside view of mixed two-ply twined weaving.

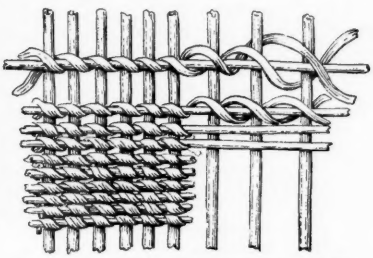


FIG. 22—Tee or lattice twined weaving. Peculiar to the Pomo, of Russian river, Cal.

5. *Three-ply twined weaving.*—Three-ply twined weaving is the use of three weft-splints or other kinds of weft elements instead of two, and there are five ways of administering the weft:

(a) *Three-ply twine* (figures 23 and 24).—In this technic the basket-weaver holds in her hand three weft elements of any of the kinds mentioned. In twisting these three, each one of the strands, as it passes inward, is carried behind the warp stem adjoining; so that in a whole revolution the three weft elements have in turn passed behind three warp elements. After that the process is repeated *ad libitum*. By referring to the lower halves of figures 23 and 24, the outside and the inside of this technic will be made plain.

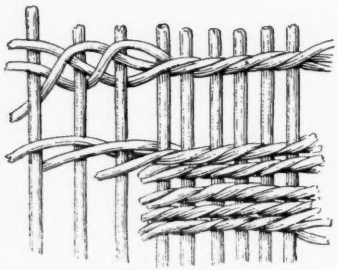


FIG. 23—Outside view of three-ply braid and three-ply twined weaving, the weft having three elements.

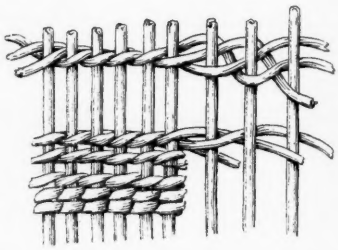


FIG. 24—Inside view of three-ply braid and three-ply twined weaving.

On the outside there is the appearance of a two-ply string laid along on the warp stems, while on the inside the texture looks like plain twined weaving. The reason for this is apparent, since in every third of a revolution one element passes behind the warp and two remain in front.

(b) *Three-ply braid.*—In three-ply braid the weft elements are held in the hand in the same fashion, but instead of being twined simply they are plaited or braided, and as each element passes under one and over the other of the remaining two elements, it is carried inside a warp stem. This process is better understood by examining the upper parts of figures 23 and 24. On the surface, when the work is driven home, it is impossible to discriminate between three-ply twine and three-ply braid. The three-ply braid is found at the starting of all Pomo twined baskets, no matter how the rest is built up.

Figure 25 shows a square inch from the surface of a Hopi twined jar. The lower part is in plain twined weaving; the upper part is in three-ply twine. Philologists have come to the conclusion that the Hopi are a very mixed people. The three-ply work shown in this figure is a Ute motive. The National Museum collections represent at least seven different styles of basketry technic practiced among the Hopi people of Tusayan.

(c) *Three-ply overlaid twined weaving.*—In Tlinkit basketry the body is worked in split spruce-root, which is exceedingly tough. The ornamentation, in which mythological symbols are concealed, consists of a species of embroidery in which the figures

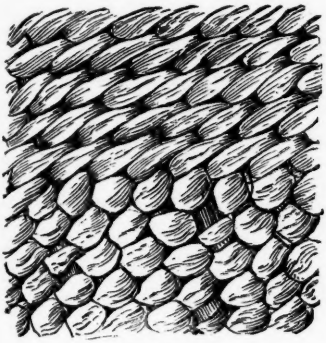


FIG. 25—Three-ply and two-ply twined weaving on the same basket jar.

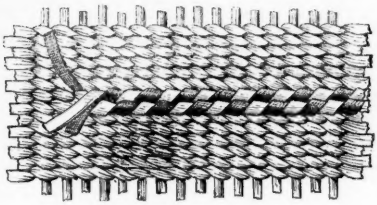


FIG. 26—Three-ply overlaid twined weaving. Tlinkit pattern. After Wm. H. Holmes.

appear on the outside of the basket, but not on the inside. In the needlework of the civilized woman the laying on of this third element would be called embroidery, but the Indian woman twines it into the textile while the process of basket-making is going on; that is, when each of the weft elements passes between two warp rods outward, the colored or overlaid element is wrapped around it once. Straws of different colors are employed (figure 26). An interesting modification of this Tlinkit form of overlaying or false embroidery occurs occasionally among the Pomo Indians under the name of *bŏg* or *băg*, and it is fully explained and illustrated by James Teit in his memoir[1] on the Thompson

[1] *Memoirs of the American Museum of Natural History*, vol. II, New York, 1900, figure 132, p. 190.

River Indians. In this Thompson River example the twine or weft element is three-ply. Two of them are spun from native hemp or milkweed, and form the regular twined two-ply weaving. Around this twine the third element is wrapped or served, passing about the other two and between the warp elements, and then the whole is pressed down close to the former rows of weaving. On the outside of the bag this wrapping is diagonal, but on the inside the turns are perpendicular. The fastening off is coarsely done, leaving the surface extremely rough. I am indebted to Dr Franz Boas for the use of Mr Teit's figure. This combination is extremely interesting. The author says that it "seems to have been acquired recently through intercourse with the Sahaptins." A little attention to the stitches will show that the bags and the motives on them are clearly Nez Percé or Shahaptian, but the wrapping of corn-husk outside the twine is not done in Nez Percé fashion, but after the style of the Makah Indians of Cape Flattery, who are Wakashan (figure 27).[1]

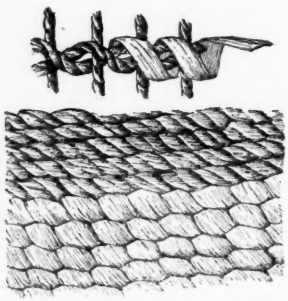


FIG. 27—Three-ply wrapped or served twined weaving. After James Teit.

II.—COILED BASKETRY

Coiled basketry is produced by an over-and-over sewing with some kind of flexible material, each stitch interlocking with the one immediately underneath it. The transition between lacework and coiled basketry is interesting. In the netted bags of pita fiber, common throughout middle America, in the muskemoots or Indian bags of fine caribou-skin thong from the Mackenzie River district, as well as in the lace-like netting of the

[1] See *Scientific American*, July 28, 1900, and *American Anthropologist* (N. S.), April, 1900.

Mohave carrying-frames and Peruvian textiles, the sewing and interlocking constitute the whole texture, the woman doing her work over a short cylinder or spreader of wood or bone, which she moves along as she works. When the plain sewing changes to half-hitches, or stitches in which the moving part of the filament or twine is wrapped or served one or more times about itself, there is the rude beginning of open lacework. This is seen in Fuegian basketry as well as in many pieces from various parts of the Old World.

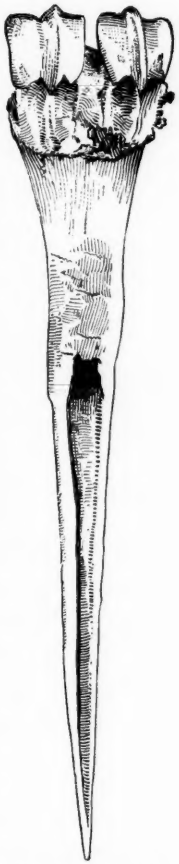


FIG. 28—Bone awl for making coiled basketry.

The sewing materials vary with the region. In the Aleutian islands it is a delicate straw; in the adjacent region it is spruce-root; in British Columbia it is cedar- or spruce-root; in the more diversified styles of the Pacific states every available material has been used—stripped leaf, grass stems, rushes, split root, broad fillets, and twine, the effect of each being well marked. In all coiled basketry, properly so-called, there is a foundation more or less rigid, inclosed within stitches, the only implement used being originally a bone awl (figure 28).

Figure 28 shows the metatarsal of an antelope sharpened in the middle and harder portion of the column, the joint serving for a grip to the hand. Mr Cushing was of the opinion that the bone awl was far better for fine basketwork than any implement of steel; the point, being a little rounded, would find its way between the stitches of the coil underneath and not force itself through them. The iron awl, being hard and sharp, breaks the texture and gives a very rough and clumsy appearance to the surface, as will be seen in figure 34. In every culture-province of

America wherever graves have been opened, the bone stiletto has been recovered, showing the widespread use of threads or filaments employed in joining two fabrics, or for perforating those already made to receive coilwork and other embroideries.

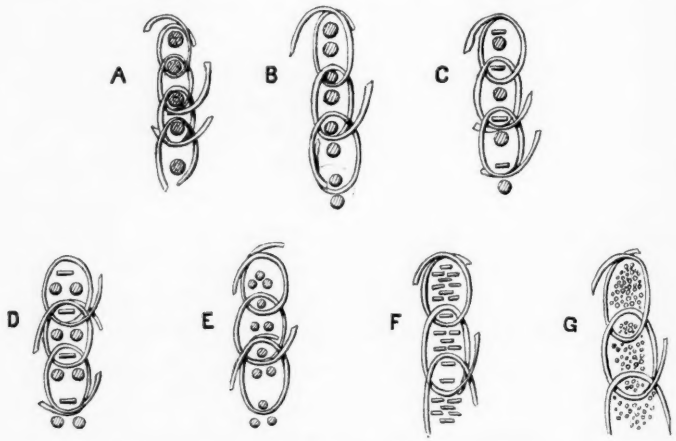


FIG. 29—End view of stitches in coiled basketry: A, single-rod foundation; B, two-rod, vertical foundation; C, rod and welt foundation; D, two-rod and welt foundation; E, three-rod foundation; F, splint foundation; G, grass or shred foundation.

Coiled basketry may be divided by the foundation filaments into the following classes:

a. Single-rod foundation.—In rattan basketry and Pacific Coast ware, called by Dr Hudson *tsai*, in the Pomo language, the foundation is a single stem, uniform in diameter. The stitch passes around the stem in progress and is caught under the one of the preceding coil, as in figure 29 A. In a collection of Siamese basketry in the National Museum the specimens are all made after this fashion; the foundation is the stem of the plant in its natural state, the sewing is with splints of the same material, having the glistening surface outward. As this is somewhat unyielding, it is difficult to crowd the stitches together and so the foundation is visible between.

In America, single-rod basketry is widely spread. Along the

Pacific coast it is found in northern Alaska and as far south as the borders of Mexico. The Pomo Indians use it in some of their finest work. The roots of plants and soft stems of willow, rhus, and the like, are used for the sewing, and being soaked thoroughly can be crowded together so as to entirely conceal the foundation (figure 30).

b. Two-rod foundation.—One rod in this style lies on top of the other; the stitches pass over the two rods in progress and under the upper one of the pair below, so that each stitch incloses three stems in a vertical series. A little attention to

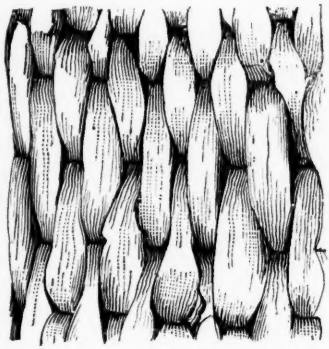


FIG. 30—Coiled work on single-rod foundation.

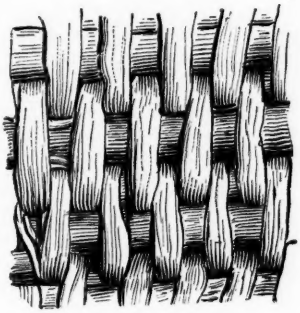


FIG. 31—Coiled work on two-rod, vertical foundation.

figure 31 will demonstrate that the alternate rod or the upper rod in each pair will be inclosed in two series of stitches, while the other or lower rod will pass along freely in the middle of one series of stitches and show on the outer side. Examples of this two-rod foundation are to be seen among the Athapascan tribes of Alaska, among the Pomo Indians of the Pacific coast, and among the Apache of Arizona. An interesting or specialized variety of this type is seen among the Mescaleros of New Mexico, who use the two-rod foundation, but instead of passing the stitch around the upper rod of the coil below, simply interlock the stitches so that neither one of the two rods is inclosed twice. This Apache ware is sewed with yucca fiber and the brown stems

of other plants, producing a brilliant effect, and the result of the special technic is a flat surface like that of pottery. The National Museum possesses a single piece of precisely the same technic from the kindred of the Apache on the lower Yukon.

c. Rod and welt foundation.— In this kind of basketry the single rod of the foundation is overlaid by a strip or splint of tough fiber — sometimes the same as that with which the sewing is done, at others a strip of leaf or bast. The stitches pass over the rod and strip which are on top down under the welt only of the coil below, the stitches interlocking. The strip of tough fiber

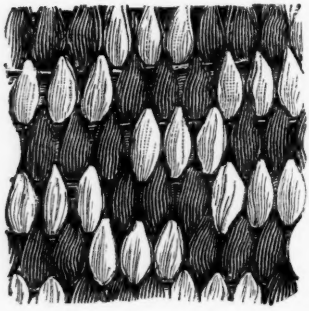


FIG. 32—Rod and welt foundation of coiled basketry.

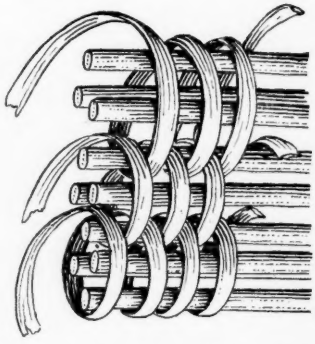


FIG. 33—Three-rod foundation in coiled basketry.

between the two rods which serves for a welt has a double purpose — strengthening the fabric and chinking the space between the rods. This style of coil work is seen on old Zuñi basket-jars and on California examples. This type of foundation passes easily into forms *a* and *b* (figures 32 and 29 C and D).

d. Three-rod foundation. — This is the type of foundation called by Dr Hudson *bam-tsu-wu*. Among the Pomo and other tribes in the western part of the United States the most delicate pieces of basketry are in this style. Dr Hudson calls them the "jewels of coiled basketry." The surfaces are beautifully corrugated and patterns of the most elaborate character can be

wrought on them. The technic is as follows: Three or four small, uniform willow stems serve for the foundation, as shown in figure 33, also in cross-section in figure 29 E. The sewing, which may be in splints of willow, black or white carex root, or cercis stem, passes around the three stems constituting the coil, under the upper one of the bundle below, the stitches interlocking. In some examples this upper rod is replaced by a thin strip of material serving for a welt (see 29 D). In the California area the materials for basketry are of the finest quality. The willow stems and carex root are susceptible of division into delicate filaments. Sewing done with these is most compact, and when the stitches are pressed closely together the foundation does not appear. On the surface of the *bam-tsu-wu* basketry the Pomo weaver adds pretty bits of bird feathers and delicate pieces of shell. The basket represents the wealth of the maker, and the gift of one of these to a friend is considered to be the highest compliment.

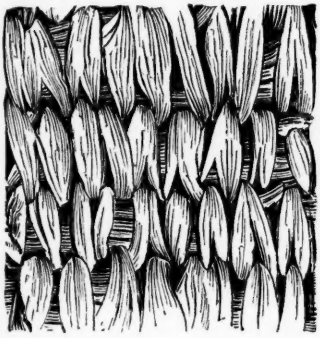


FIG. 34—Splint foundation of coiled basketry.

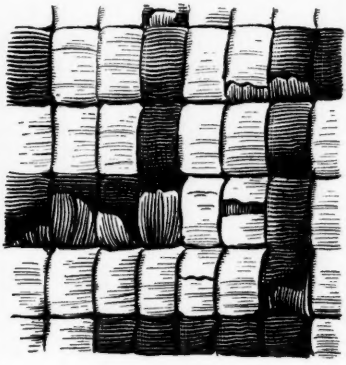


FIG. 35—Imbricated variety of splint coil in basketry, called Klikitat stitch.

e. Splint foundation.—In basketry of this type the foundation consists of a number of longer or shorter splints massed together and sewed, the stitches passing under one or more of the splints in the coil beneath (figures 29 F and 34). In the Pomo

language it is called *chilo*, but it has no standing in that tribe. In the Great Interior basin, where the pliant material of the California tribes is wanting, only the outer and younger portion of the stem will do for sewing. The interior parts in such examples are made up into the foundation. All such ware is rude, and the sewing frequently passes through instead of around the stitches below. In the Klikitat basketry the pieces of spruce or cedar root not used for sewing material are also worked into the foundation (figures 35–37).

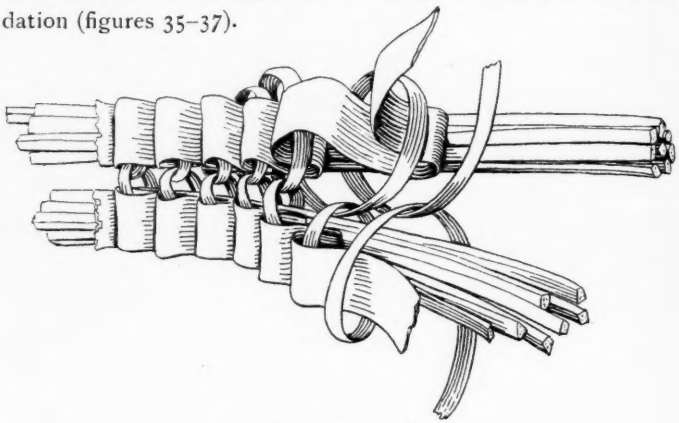


FIG. 36—Detail of imbricated basketry.

In a small area on Fraser river, in southwestern Canada, and on the upper waters of the Columbia, basketry called "Klikitat" is made. The foundation, as stated, is in splints of cedar or spruce root, while the sewing is done with the outer and tough portion of the root; the stitches pass over the upper bundle of splints and are locked with those underneath. On the outside of these baskets is a form of technic which also constitutes the ornamentation. It is not something added, or overlaid, or sewed on, but is a part of the texture effected in the progress of the manufacture (figures 36, 37).

The method of adding this ornamentation in strips of cherry bark, cedar bast, and grass stems dyed with Oregon grape, is

unique, and on this account I have applied the term *imbricated* to the "Klikitat" basket, as shown in figures 35 to 37. The strip of colored bark or grass is laid down and caught under a passing stitch; before another stitch is taken this strip is bent forward to cover the last stitch, doubled on itself so as to be underneath the next stitch, and so with each stitch it is bent backward and forward so that the sewing is entirely concealed, forming a sort of "knife plaiting." In some of the finer old baskets in the National Museum, collected sixty years ago, the entire surface is covered

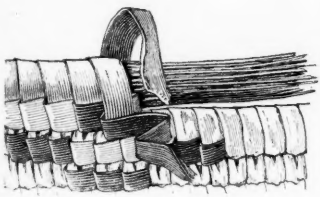


FIG. 37—Imbricated basketry detail from the Thompson River Indians, British Columbia. After James Teit.

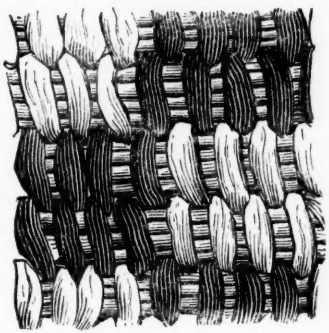


FIG. 38—Coiled basketry with grass foundation.

with work of this kind, the strips not being over an eighth of an inch wide. Mr James Teit[1] describes and illustrates this type of weaving among the Thompson River Indians of British Columbia, who are Salishan. The body of the basket is in the root of *Thuja gigantea*, and the ornamentation in strips of *Elymus triticoides* and *Prunus demissa* (figure 37).

f. Grass foundation.—The foundation of this type of basketry is made up of a small bundle of straws or rushes. The sewing may be done with split stems of hardwood, willow, rhus, and the like, or, as in the case of the Mission baskets in southern California, of the stems of rushes (*Juncus acutus*), or stiff grass (*Epicampes rigidum*). See figure 38 and the cross-section given in figure 29 G. In the larger granary baskets of the Pima a bundle

[1] *Memoirs of the American Museum of Natural History*, Anthropology, I, page 189, figure 131 *a*.

of straws furnishes the foundation, while the sewing is done with broad strips of tough bark, as in figure 39. In the Fuegian coiled basketry, of which no figure is given, the sewing is done with rushes, but instead of being in the ordinary over-and-over stitch it consists of a series of half-hitches or buttonhole stitches.

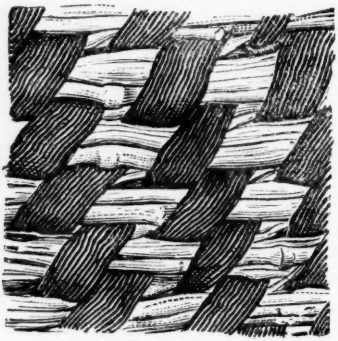


FIG. 39—Coiled work sewed with broad strips of tough bark.

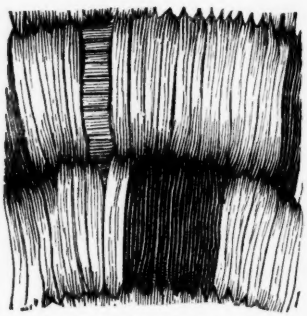


FIG. 40—Coiled work on shred foundation, from the hard parts of yucca leaves.

Among the basketry belonging to the grass-coil foundation type are the Hopi plaques built upon a thick bundle of the woody stems of the yuccas, which furnish also the sewing material from the split leaf (figure 40). If this be examined in comparison with a style of basketry found in Egypt and in northern Africa as far as the Barbary states, great similarity will be noticed in the size of the coil, the color of the sewing material, the patterns, and the stitches. The suggestion is here made that this particular form of workmanship may be due to acculturation, inasmuch as this type of basketry is confined in America to the Hopi pueblos, which were brought very early in contact with Spaniards and African slaves.

Ornamentation in basketry is produced by the use of different colored materials, by overlaying, embroidery, dyes, featherwork, shells, beads, etc. The technic of decoration and the geographic distribution of the forms of technic explained in this paper must be reserved for another time.

MEMORANDA ON THE MAYA CALENDARS USED IN THE BOOKS OF CHILAN BALAM

By CHARLES P. BOWDITCH

Dr Brinton, in his *Maya Chronicles*, has translated the following passages from the Book of Chilan Balam of Mani:

. . . in the thirteenth Ahau Ahpula died; for six years the count of the thirteenth Ahau will not be ended; the count of the year was toward the East, the month Pop began with (the day) fourth Kan; the eighteenth day of the month Zip (that is) 9 Ymix, was the day on which Ahpula died; and that the count may be known in numbers and years, it was the year 1536.

And again from the Book of Chilan Balam of Tizimin:

The thirteenth Ahau; the death of Ahpulha took place; it was the sixth year when ended the count of the thirteenth Ahau,— the count of the year was from the east (the month) Pop passed on the fourth Kan; on the eighteenth of (the month) Zip, 9 Imix was the day Ahpulha died; it was the year 1536.

In his remarks on these books Dr Brinton says:

According to the reckoning as it now stands, six complete great cycles were counted, and parts of two others, so that the native at the time of the Conquest would have had eight great cycles to distinguish apart.

I have not found any clear explanation how this was accomplished. We do not even know what name was given to this great cycle,[1] nor whether the calendar was sufficiently perfected to prevent confusion in dates in the remote past.

It would seem, however, as if the reckoning of time as given in these books is very accurate, fixing a date which would not be

[1] It should be noted that the grand cycle, which Dr Brinton refers to, is the period of 13 x 7200 days = 93,600 days or 260 periods of 360 days; while the grand cycle according to Goodman's method is 13 x 144,000 days or 5200 periods of 360 days.

duplicated within a limit of thirty-five hundred or four thousand years.

The Books of Chilan Balam number the katuns on a different principle from that used on the inscriptions or in the Dresden Codex, but the two methods can be readily and usefully brought together, as the katun itself remains the same in both methods. In the inscriptions the katuns are numbered from 0 to 19, using Goodman's method though not his exact nomenclature, and twenty of them equal one cycle. In the Chilan Balam books, the katuns are named as Katun 13 Ahau, Katun 11 Ahau, etc., these being the days with which they begin or with which the previous katun ended; and as after thirteen katuns the same name is again given, this nomenclature fixes a date within a period which equals 13 multiplied by the number of days in a katun. There has been a difference of opinion as to this number of days in a katun, but it is clear from the Books of Chilan Balam that their reckoning was by terms of 20 x 360 days. The followers of Perez, however, insist that the length of the katun was 24 x 365 days. Sr Perez has indeed made this assertion,[1] but he rests his opinion to a great degree on the fact that the naming of the katuns proceeded in the following order, taking their names from the day Ahau with which they began, viz.:

Katun 13 Ahau,
Katun 11 Ahau,
Katun 9 Ahau,
Katun 7 Ahau, etc.,

and that by starting with a katun which begins with 13 Ahau and counting forward a period of 24 x 365 days, we should reach another katun beginning with 11 Ahau. But the same result is brought about by considering the katun as a period of 20 x 360 days, as has been shown by Dr Seler, among others; and since the Books of Chilan Balam state distinctly that they reckon by so

[1] Stephens, *Incidents of Travel in Yucatan*, p. 441 et seq.

many scores of so-called years, and as the initial dates of the inscriptions all reckon in the same way, it is now generally considered that the katun consisted of 20 x 360 or 7200 days. An objection to considering a katun as 20 x 360 days may be raised in that the Books of Chilan Balam use the word "año" or year, but this can be easily explained by the fact that the Spanish "year" was the period which most nearly agreed with their tun or 360-day period, and that the Books did not pretend to speak with scientific accuracy.

Besides the above count, it is well known that the Mayas had a year-and-month count. This consisted in naming each one of the twenty days and in attaching to each of these days one of the numbers 1 to 13. Besides this, each day so numbered was declared to be a given day of a given month and to occur in a year marked by one of the year bearers—as for instance in the Book of Chilan Balam, already quoted, where the day is given as 9 Ymix 18 Zip in the year 4 Kan. Now this day and this year could recur only after the lapse of fifty-two years or 18,980 days.

It should be noted here that in the inscriptions and in the Dresden Codex, the day Ymix was always the day 4, 9, 14, or 19 of any month, showing that the day 1 of the month was Eznab, Akbal, Lamat, or Ben; while in Landa and the Books of Chilan Balam the day Ymix was the day 3, 8, 13, or 18, showing that the day 1 of the month was Cauac, Kan, Muluc, or Ix. That is, the months in modern times began with the day which followed the day with which the months began in more ancient times. As the tables are calculated for the inscriptions, it will be well, in order to facilitate our calculations, to call the day on which Ahpula died the nineteenth of the month Zip, instead of the eighteenth of that month.

Given that the katun consisted of 7200 days, a Katun 13 Ahau could not recur until after the lapse of 13 x 7200 or 93,600 days, and the recurrence of any day marked by the year-and-month count, and occupying any particular place in a given katun, could

not occur until after the lapse of a period which is found by finding the least common multiple of the two numbers 93,600 and 18,980. This is 6,832,800 days, which is a period of 360 calendar rounds of 18,980 days or of 52 years each. This is equal to 18,720 years, and, in the method of reckoning shown in the initial dates of the inscriptions, would equal 3 grand cycles, 8 cycles, and 9 katuns, or, to use the method of Goodman, 3.8.9.0.0.0.

I have said that a day marked by the year-and-month count, and occupying any particular place in a given katun, could not recur until the lapse of this long period. This would be true if the day was specified as being a given day in a given tun in a given katun, or even if the day was stated as falling in a given uinal of a given tun in a given katun. But in the case before us the death of Ahpula is said to have taken place in the Katun 13 Ahau when six tuns or years of that katun remained unexpired. Even with this rather loose designation such a day would not recur within a period of 3500 or 4000 years.

The day 4 Ahau 8 Cumhu seems to have been regarded as the beginning day of the beginning cycle of some grand cycle. From this day all the initial series of the inscriptions of Copan and Quirigua, of Piedras Negras and Tikal, so far as we know them, count, except one where this day 4 Ahau 8 Cumhu is itself given. In this place (on Stela C of Quirigua) 4 Ahau 8 Cumhu is reckoned thus: "Grand cycle glyph .13.0.0.0.0.", while in the Temple of the Cross it is declared to be a thirteenth cycle. As this was the beginning date, there is reason to believe that the beginning cycle of a great cycle received the number 13.

I give here the first and last terms of a list of the beginning days of the Katuns 13 Ahau in a complete round of 18,720 years occurring after the beginning of the grand cycle called by Goodman Grand Cycle 54, which began with 4 Ahau 8 Cumhu. It is of little consequence what particular number is given to the grand cycle, as the whole series forms a continuous count, and I

shall therefore follow Goodman, who gives the number 54 to the grand cycle glyphs common to Copan, Quirigua, etc.

If 54.13.0.0.0.0. or the beginning of the grand cycle, called Grand Cycle 54 by Goodman, begins with 4 Ahau 8 Cumhu, a Katun 13 Ahau will appear two katuns after this or with the count of

54.13.2.0.0.0. 13 Ahau 8 Mol Year 10 Ix,

and other Katuns 13 Ahau will follow at intervals of 13 katuns as here given:

54.13.15.0.0.0.	13 Ahau	8 Pax	Year 6 Ix.
1. 8.	"	3 Xul	3 Cauac.
2. 1.	"	3 Kankin	12 "
. . . . .			
57.5.19.0.0.0.	13 Ahau	18 Ceh	11 Kan.
6.12		13 Uo	8 Muluc.
7. 5.		13 Yax	4 "
18.		13 Cumhu	13 "
57.8.11.0.0.0.	13 Ahau	8 Mol	10 Ix.

But we are seeking a Katun 13 Ahau in which 14 tuns have elapsed and of which 6 tuns still remain unexpired. We must, therefore, add 14 tuns or 14 x 360 days = 5040 days to each of the dates given and we shall then have the following complete list of the beginning days of Tun 14 of Katun 13 Ahau for the term of 18,720 years:

54.13. 2.14.0.0.	9 Ahau	18 Zotz	11 Kan.
15.		18 Ceh	7 Kan.
1. 8.		13 Uo	4 Muluc.
2. 1.		13 Yax	13 Muluc.
14.		13 Cumhu	9 Muluc.
3. 7.		8 Mol	6 Ix.
4. 0.		8 Pax	2 Ix.
13.		3 Xul	12 Cauac.
5. 6.		3 Kankin	8 Cauac.
19.		18 Zip	5 Kan.
6.12.		18 Zac	1 Kan.
7. 5.		13 Pop	11 Muluc.

18.	13 Chen	7 Muluc.
54. 8.11.14.0.0.	13 Kayab	3 Muluc.
9. 4.	8 Yaxkin	13 Ix.
17.	8 Muan	9 Ix.
10.10.	3 Tzec	6 Cauac.
11. 3.	3 Mac	2 Cauac.
16.	18 Uo	12 Kan.
12. 9.	18 Yax	8 Kan.
55.13. 2.14.0.0.	18 Cumhu	4 Kan.
15.	13 Mol	1 Muluc.
1. 8.	13 Pax	10 Muluc.
2. 1.	8 Xul	7 Ix.
14.	8 Kankin	3 Ix.
3. 7.	3 Zotz	13 Cauac.
4. 0.	3 Ceh	9 Cauac.
13.	18 Pop	6 Kan.
5. 6.	18 Chen	2 Kan.
5.19.	18 Kayab	11 Kan.
6.12.	13 Yaxkin	8 Muluc.
7. 5.	13 Muan	4 Muluc.
18.	8 Tzec	1 Ix.
8.11.	8 Mac	10 Ix.
9. 4.	3 Zip	7 Cauac.
17.	3 Zac	3 Cauac.
10.10.	3 Uayeb	12 Cauac.
11.03.	18 Mol	9 Kan.
16.	18 Pax	5 Kan.
12. 9.	13 Xul	2 Muluc.
56.13. 2.14.0.0.	13 Kankin	11 Muluc.
15.	8 Zotz	8 Ix.
1. 8.	8 Ceh	4 Ix.
2. 1.	3 Uo	1 Cauac.
14.	3 Yax	10 Cauac.
3. 7.	3 Cumhu	6 Cauac.
4. 0.	18 Yaxkin	3 Kan.
13.	18 Muan	12 Kan.
5. 6.	13 Tzec	9 Muluc.
5.19.	13 Mac	5 Muluc.
6.12.	8 Zip	2 Ix.

7. 5.	8 Zac	11 Ix.
18.	3 Pop	8 Cauac.
8.11.	3 Chen	4 Cauac.
9. 4.	3 Kayab	13 Cauac.
17.	18 Xul	10 Kan.
10.10.	18 Kankin	6 Kan.
11.03.	13 Zotz	3 Muluc.
16.	13 Ceh	12 Muluc.
12. 9.	8 Uo	9 Ix.
57.13. 2.14.0.0.	8 Yax	5 Ix.
15.	8 Cumhu	1 Ix.
1. 8.	3 Mol	11 Cauac.
2. 1.	3 Pax	7 Cauac.
14.	18 Tzec	4 Kan.
3. 7.	18 Mac	13 Kan.
4. 0.	13 Zip	10 Muluc.
4.13.	13 Zac	6 Muluc.
5. 6.	8 Pop	3 Ix.
5.19.	8 Chen	12 Ix.
6.12.	8 Kayab	8 Ix.
7. 5.	3 Yaxkin	5 Cauac.
18.	3 Muan	1 Cauac.
8.11.	18 Zotz	11 Kan.

The only places where a year 4 Kan appears are at the dates

55.13. 2.14.0.0.[1]	9 Ahau	18 Cumhu	Year 4 Kan, and
57. 2.14.14.0.0.	9 Ahau	18 Tzec	Year 4 Kan.

But as the words used are that 6 years (or tuns) remained before the end of the katun, and as a slightly longer time than just 6 tuns may have remained, and as the month Zip in which the death of Ahpula occurred is the third month of the year and so is near the beginning of the year 4 Kan, it is quite possible that the beginning of the Tun 14 may have been in the latter part of

[1] It is necessary to remember that, by Goodman's methods, these figures represent periods of past time. Thus the number 2 of the katun means that 2 katuns have passed, and that the current katun is what we should call the third; and that 0.0 means that a full count of uinals and kins has occurred and that the current uinal and kin are what we should call the first.

the preceding year, in which case, in addition to the preceding dates, the following date might be the one which we are seeking:

55. 9.17.14.0.0. 9 Ahau 3 Zac Year 3 Cauac.

As 9 Ymix 19 Zip is said to be in the year 4 Kan, we shall find this date before the dates of the beginning of Tun 14 in the first two cases and after the beginning of Tun 14 in the last case. This date of 9 Ymix 19 Zip will then be numbered thus, placing the three dates in consecutive order:

1) 55.13. 2.13. 3. 1. 6 tuns 299 days to end of Katun 13 Ahau.
2) 55. 9.17.14.11. 1. 5 " 139 " " " "
3) 57. 2.14.13.16. 1. 6 " 39 " " " "

In no one of the cases is the date 9 Ymix 19 Zip exactly 6 tuns before the end of the Katun 13 Ahau, but it is possible that the annalist took no account of fractions of tuns, either in excess of the 6 tuns or otherwise. Thus in the first and last cases of the three, as first given, he may have said to himself, "There are but 6 whole tuns remaining of the katun and I will call it 6," or in the second case he may have said: "There are 5 tuns remaining and 139 days besides; I will call it 6 tuns." Whichever was the plan he followed, we can have at present no means of ascertaining except from the results which we obtain by calculation.

The date found on Stela 9 of Copan, which is the earliest date of these stelæ of that place, in which the numbers preceding the period glyphs are given by the line-and-dot method, is 54.9.6.10.0.0. This precedes the above dates by the following periods:

1) 0.3.16.3. 3.1. = 548,341 days = 1,502 years 111 days.
2) 1.0.11.4.11.1 = 1,952,861 " = 5,350 " 14 "
3) 2.6. 8.3.16.1 = 4,667,001 " = 12,786 " 111 "

If, now, we accept the first date of 55.13.2.13.3.1. as the date of Ahpula's death, we shall have the date of Stela 9 of Copan as A.D. 34, since the death occurred in 1536. If we accept the second

date, 55.9.17.14.11.1., as the true one, Stela 9 must represent a date of B.C. 3814, and in the case of the third date, 57.2.14.13.16.1. in which the period to elapse to the end of Katun 13 Ahau is the nearest to an exact 6 tuns, we should throw back Copan to B.C. 11,250. It is not probable, however, that either of the last two dates is correct, both because of the immense time which would have elapsed and because the monuments show signs of no such age. We are therefore left to the date A.D. 34 as the probable date of the earliest stela of Copan which we know of at present.

The following table gives the earliest and latest dates in Copan and Quirigua as far as we know them, together with the dates of our calendar corresponding thereto, on the supposition that the above date is rightly deciphered:

Copan: Stela 9,	9. 6.10.0.0			A.D. 34.
" N,	9.16.10.0.0 = 197	years later than	A.D. 34	A.D. 231.
Quirigua: " C,	9. 1. 0.0.0 = 108 +	" earlier "	"	say B.C. 75.
" K,	9.18.15.0.0 = 241 +	" later "	"	A.D. 275.

If this is correct, Copan lasted, so far as the erection of stelæ is concerned, for about 200 years, and Quirigua for about 350 years, though of course this may be only a small part of the period of their existence.

The above calculations have been made on the supposition that the initial dates record the date of the erection of the stelæ, and on the further supposition, as has been stated, that the same principle of calculating time has been continued from the earliest ages. There is, however, some evidence that a change has been made, at least in detail. It has already been seen that the beginning day of the month has been shifted from the Eznab, Akbal series to the Cauac, Kan series of days. What difference this would have made in the relation of the year-and-month count with the long count it is impossible to say without knowing the means used to effect the change; but it is quite likely that this relation was not affected. In the Book of Chilan Balam of Mani

is the entry: "The Thirteenth Ahau; then Pop was counted in order." And in the Book of Chilan Balam of Chumayel we find, "The Thirteenth Ahau; Pop was set in order." This statement occurs in the early part of the chronicle, and the calculation of the Ahaus goes on after it in exactly the same way as before it. This setting in order of Pop would not then seem to have made any difference in the long count. At least it is very probable that it means merely that the seasons and the calendar were made to agree.

Dr Brinton (*Maya Chronicles*, p. 85) also gives a translation of a part of the Codice Perez, which refers to the "Doubling of the Katuns." The statement is very obscure, but only tends to show that while the counting of the katuns was carried on as in the Books of Chilan Balam, the first of the series was called Katun 8 Ahau instead of Katun 13 Ahau, while the last of the series was Katun 10 Ahau. This would not necessarily change the consecutive order of the katuns, but might merely give a new starting-point.

While, therefore, it is impossible to say what change, if any, was made in the reckoning of time, it may be said that there is no evidence at present to show that the old relation of the long count to the year-and-month count and to the count of the Books of Chilan Balam did not continue to the time of the arrival of the Spaniards. Moreover, the date of A.D. 34 for the monuments of Copan and Quirigua is by no means unlikely to be the true one. At all events the above discussion of the reckoning will not be useless if it succeeds in bringing out new facts, and no one will be more ready to recognize any new evidence than I shall be, even if the above deductions shall be shown to be erroneous.

THE ILL HEALTH OF CHARLES DARWIN: ITS NATURE AND ITS RELATION TO HIS WORK

By W. W. JOHNSTON

EVIDENCE OF THE EXISTENCE OF ILL HEALTH

No one can read the story of Darwin's life without being impressed with the frequent allusions to his ill health. In his *Autobiography*, in the *Reminiscences* written by his son, and in the collection of his letters these allusions are met with on almost every page. From the three sources mentioned I have abstracted forty-two pages of type-written matter which refer directly to this subject. The following quotation from the *Reminiscences* is a full and very clear statement of the state of Darwin's health:

> If the character of my father's working life is to be understood, the conditions of ill health under which he worked must be constantly borne in mind. He bore his illness with such uncomplaining patience, that even his children can hardly, I believe, realize the extent of his habitual suffering. In their case the difficulty is heightened from the fact that from the days of their earliest recollections they saw him in constant ill health. . . . It is, I repeat, a principal feature of his life, that for nearly forty years he never knew one day of health of ordinary men, and thus his life was one long struggle of the weariness and strain of sickness.

Darwin's letters to his scientific friends are full of references to persistent suffering and to the interruptions and delays that were caused by continued illness. The above extract, with others which the limits of this paper will not permit me to quote, show the continuity and extent of these sufferings from the year 1836, the date of his arrival in London after the *Beagle* voyage, until his death on April 19, 1882, a period of forty-six years. The

story of these years is one of intense application to work and of unremitting suffering, and it was while reading the *Autobiography* that I became anxious to know the nature of this illness that lasted nearly half a century, an illness so severe as to make life a burden and yet which did not shorten life nor prevent the completion of the great work which made Darwin's name immortal.

Various opinions have been expressed by the friends of Darwin as to the nature of his illness. His continued sufferings were said to have been the result of prolonged seasickness and of inherited dyspepsia, but no rational or complete diagnosis of his disease with an explanation of its causes is on record. To give a name to the assemblage of symptoms so fully described in the *Autobiography* and the *Reminiscences* is the object of this paper.

HISTORY OF DARWIN'S ILLNESS

From the quotation given above it is clear that Darwin was ill and suffering during the whole of his working life, and especially during that period of it in which his best work was accomplished. But before attempting a diagnosis of his illness it is necessary, of course, to know something of its history and to study the character of the symptoms distinguishing it.

In early life Darwin was strong, much given to outdoor life and in the latter part of his school days passionately fond of shooting. "I don't believe," he says, "that any one could have shown more zeal for the most holy cause than I did for shooting birds." His father told him that "he cared for nothing but shooting, dogs, and rat catching."

His strong constitution and large frame he inherited from his father's family, which he most closely resembled. His grandfather, Dr Erasmus Darwin, died at 71, his father, also a physician, at 82, bequeathing to their descendant a tendency to long life. From them, too, he no doubt received in part at least the great brain capacity to which all his portraits bear witness.

By his unappreciative teachers he was considered an ordinary

boy, though he "had strong and diverse tastes, much zeal for what interested him, and a keen pleasure in understanding any complex subject or thing." Natural objects interested him most, and this fact, perhaps, as well as the influence of father and family sent him to Edinburgh to study medicine. Attendance upon two very severe operations from which he rushed before their completion convinced him that he could never be a physician. This discouragement was hardly justifiable, and yet it is fortunate for science that his life was not confined to a strictly professional career.

The taking of clerical orders was considered by his father next best to the practice of medicine, and he was sent to Cambridge to start afresh and to make preparatory studies with this in view. "Here," he says, "the time as far as academical studies were concerned was as thoroughly wasted as at school and in Edinburgh." No pursuit was followed with half the eagerness and none gave him so much pleasure as collecting beetles, and his studies for the ministry made little headway.

The three years at Cambridge were, he thought, the most joyous of his life because "he was in excellent health and always in high spirits." Up to this time there had been no sign of ill health; his brain had not been taxed, and with the exception of collecting beetles and shooting birds he had done little serious work.

To those, however, who could appreciate him he had already shown the promise of his mind, and to Professor Henslow, who recommended him for the position of naturalist to H.M.S. *Beagle* on her projected voyage of study and discovery, is due the honor of having launched Darwin upon his career. Captain Fitzroy's objection to the shape of Darwin's nose was not allowed to stand in the way, and after some little hesitation the young man accepted the appointment and took the most important step of his life.

It was at Plymouth, while waiting, much depressed in mind,

for the sailing of his ship, that the earliest symptoms in the long train which followed him through life first appeared. These symptoms were palpitation and pain about the heart. He was then 22 years of age, and it is easy to understand how, at this age, the mingled feelings of excitement and gloom on leaving home should have caused such nervous disturbances. He thought, however, that he had disease of the heart, but because he "expected to hear the verdict that he was not fit for the voyage," he would not see a physician. His ambition "to take a fair place among scientific men" urged him to go at all hazards and he sailed for South America two days after Christmas day, 1831.

During this voyage of five years we have no knowledge of Darwin's health except from himself, and his journal contains but few references to the subject. He speaks of being ill, of occasionally feeling so exhausted as to be compelled to rest, but there is no definite statement of symptoms. His power of endurance was evidently very great at this time, and it is mentioned by his son that, on the occasion of a shore excursion when all were suffering for want of water, Darwin "was one of the two who were better able than the rest to struggle on in search of it."

His son alludes to only one serious illness in South America. In this attack Darwin said that every secretion of the body was affected, but the symptoms were so ill-defined that his father, Dr Darwin, could not make a guess as to their nature.

The voyage began December 27, 1831, and ended on October 2, 1836. During the two years and three months between this latter date and his marriage in 1839, he was occasionally unwell. From his marriage until the date of his leaving London, a period of nearly three years, he had frequently recurring illnesses, one of them long and serious. He was losing ground year by year, and a geological excursion in Wales was the last that he had the strength to make. Increasing weakness, the inability to meet his scientific friends, to attend society meetings, and at the same time to carry out his plan of scientific work made him take the resolution to leave

London forever and to live in the country. This decision, next in importance to the *Beagle* voyage, had the most far-reaching influence on his life. Out of it grew the ability to complete *The Origin of Species* and the rest of his marvelous contributions to science.

The symptoms that appeared after settling at Down, his country home, are more characteristic than any before described in the *Autobiography*. They followed the excitement of receiving and conversing with friends and consisted of violent shivering with vomiting and giddiness. At times he was so giddy as to need an alpenstock to steady him even in the house. He was very sensitive to both heat and cold; if anything went wrong with his work he would complain of a sense of oppression from heat.

Insomnia was one of the most constant and most distressing of his symptoms. This varied with circumstances—"half an hour more or less conversation would make to him the difference of a sleepless night and of the loss perhaps of half the day's work." "He often lay awake or sat up in bed for hours, suffering much discomfort from the activity of his thoughts . . . his mind working at some problem which he would willingly have dismissed." Any departure from the regular routine of his life upset him, and he paid the penalty of suffering for every infraction of his self-ordered regime. "Anything that flurries me knocks me up afterwards and brings on a violent palpitation of the heart"—he wrote to a friend.

The early morning was the only time when he could make any exertion. "Towards evening his step was slow and labored, and mounting the steps was an effort."

Darwin soon learned to know that for increasing suffering there was but one remedy—a complete abandonment of all writing and absence from home and study. Thus began the habit of taking holidays. When about to leave home the making ready and the anticipation of the journey caused "a miserable, sinking feeling" that gave great disquiet but passed away as soon as the journey was begun.

As the years went by all invitations were refused; social life was practically given up and he rarely felt well enough to receive visits from scientific friends.

The allusions in his diary to the condition of bad health increased with the years and the holidays became longer and more frequent. In the earlier years fluctuations occurred, and at times he speaks of gaining ground, but by 1846 he was usually hopeless and much depressed by continued sleeplessness, indigestion, and prostration. By 1852 he rarely ever went to London, and during the succeeding years he was never free for a day from suffering. In 1859 he wrote that his health had "quite failed," that he had great prostration of mind and body, bad headaches, with frequent attacks of acute exhaustion; his work is spoken of as a burden from which he would gladly be freed. He was then often confined to the house for weeks at a time; he suspected that he would soon entirely fail and believed that he must husband the little strength left in order to finish his work. Everything unusual disturbed him; a conversation of two and a half hours with his nephew made him ill half the night. In 1863 he wrote that he had been very busy and uncomfortable from a feeling of fulness, slight pain, and tickling about the heart. These symptoms with those previously described continued during 1860, 1861, and 1863. In 1864 appears the entry, "Ill all January, February, March."

There is very little doubt that these casual allusions to illness during these 27 years do not give an exaggerated picture of the suffering endured. Nor does the calm and well-balanced mind of Darwin justify the belief that the symptoms were imaginary, that he was simply an intellectual hypochondriac, distorting his feelings and creating pain where none existed. There is the positive testimony of his son that he suffered from insomnia, vertigo, an abnormal sensibility to heat and cold, dizziness, vomiting, sensations of distress about the heart, chronic indigestion, and prostration chiefly affecting the nervous system after mental strain. Monotony benefited him; unusual excitement broke him down.

His symptoms bore a close relation to the amount and character of his work; overwork or a long continuance of moderate work made him ill; rest from work made him better. But there was no radical improvement at any time; the changes for the better were only temporary; and he was pursued during the 27 years by a feeling of hopelessness and the dread that he would not live to finish the great task he had set himself to do. It is, however, a significant fact that he did live, not wasting much, preserving a fair amount of nutrition as his pictures show, and working with undiminished ardor and success during all this time.

The year 1864 was marked by a temporary improvement; but the change was without much effect on his despondency, as in this year he wrote: "I wonder so old a wornout dog as I am is not quite forgotten." The following year began with less ill health, for he seems to have given himself up to a greater degree of rest from work than before. From April to December he did practically no work with the exception of looking over *The Origin of Species* for a second French edition.

Through 1866 his health improved and in 1867 he wrote that he had rested and felt more himself. In this year he was busy with *The Descent of Man*, a work that exhibits the greatest industry and the fulness of his genius, and yet he was far from well, for on a visit to London he failed to keep half his engagements and was confined to the house for some time. On a visit to Wales in the same year he was ill and saddened because of his inability to wander over the hills as he had once done. He wrote a friend at this time: "I have been as yet in a very poor way; it seems as soon as the stimulus of mental work stops my whole strength gives way. As yet I have hardly crawled half a mile from the house, and then have been fearfully fatigued. It is enough to make one wish oneself quiet in a comfortable tomb." This is the story of the next two years. In June, 1870, he wrote that he had been better of late. In the next year he speaks of discomforts and miseries and of the inability to hear even much reading aloud.

Darwin was now, in 1872, sixty-three years of age. For the first time since the beginning of his illness a marked change for the better appeared, and during the last ten years of his life—from 1872 to 1882—"the condition of his health was a cause of satisfaction and hope to his family." His health showed signs of amendment in several particulars. There was less distress and discomfort, and he was able to work more steadily. It is a fair conclusion that this improvement was in great part due to the wise counsel of Sir Andrew Clark, who was at this time frequently consulted. His son says: "It was not only for the generously rendered service that my father felt a debt of gratitude towards Sir Andrew Clark. He owed to his cheering personal influence an often repeated encouragement, which latterly added something real to his happiness, and he found sincere pleasure in Sir Andrew's friendship and kindness towards himself and his children."

These last years were marked, then, by a general improvement. Work was continued intermittently. The symptoms connected with the nervous system were less distressing, but there was a certain loss of physical vigor with more frequent attacks of pain or uneasiness about the heart. He speaks at this time of the wearisomeness of life and of approaching death. On the 13th of December, 1881, he had the first of a series of attacks of angina pectoris. Irregularity of the pulse followed with attacks of faintness. In April, 1882, these symptoms were aggravated, and fainting attacks, from which he recovered with difficulty, recurred. During the night of the 18th there was a severe attack of this kind. He recognized the approach of death and said, "I am not in the least afraid to die." After much suffering from nausea and faintness death came on the next day, April 19, 1882. He was in his seventy-fourth year.

The life of Darwin can be divided into four periods, each one characterized by a different condition of health:

1. From birth to the age of 22. He was at this time in

excellent health, active-minded with keen sensibilities, devoted to outdoor life and exercise.

2. From the age of 22 to 27 — the period covered by the *Beagle* voyage. He was then strong, capable of bearing great physical fatigue, but taxing his mental and physical endurance to the utmost. Rare and sudden illnesses occurred, brought on by unusual strain on mind and body.

3. From his return to England in 1836 to 1872. This period of thirty-six years represents the time of his most severe suffering and of the accomplishment of the greatest part of his work; there were fluctuations, but he was never well.

4. From 1872 to 1882. A notable improvement in the nervous symptoms which had made life miserable and work difficult marked this period. He was less despondent, worked more easily, and we do not read of the distressing insomnia, exhaustion from conversation, indigestion, and other causes of suffering so frequently mentioned in the preceding years. At this time he developed new symptoms, however, which took the place of those enumerated. These were clearly due to atheromatous and senile changes in the heart and vessels. With advancing years, angina pectoris and accompanying cardiac exhaustion led to his death in 1882.

CAUSES OF DARWIN'S ILL HEALTH

1. *The Voyage of the Beagle.*—The voyage of the *Beagle* was the real beginning of Darwin's intellectual life. It awakened new and exciting interest in a new and congenial sphere and aroused all the dormant energy of his strong mind. No one can read his *Journal of Researches* without realizing how great was his mental activity during those five years and how intensely he was stimulated by his new and vast experience. He was here brought face to face with all the physical and biological problems of the day and he had leisure to ponder on every phase of the phenomena observed, free from the distractions of society and from the influence of other minds. All the conditions then existed most

favorable to the formation of habits of original thought, and *The Origin of Species* first saw light in the cabin of the *Beagle*.

The exercise of his mind, however, was not with Darwin altogether along normal lines; it was the inherent tendency of his nature to overstrain his faculties. His work on the *Beagle* was always overwork; his nervous system was always inevitably and unavoidably overtaxed.

As the naturalist of the expedition all the work in botany, zoölogy, and geology fell upon him. The range of his work was therefore very wide and very exacting; it was his part to collect specimens connected with all these departments, to keep full notes of all phenomena observed, to work with the microscope, and to study the countries and peoples visited. A very severe task this was for a young man of 22 to 25 years; how well he profited by his opportunities his *Journal of Researches* and his after life show.

Besides the mental overstrain involved in such work there were the wear and tear of the physical discomforts of ship life with the fatigue of long land journeys and the exposure to the influence of heat and cold in many different climates. Admiral Lord Stokes, who as a midshipman was one of the *Beagle* ship's company, wrote in 1883:

> Perhaps no one can better testify to his early and most trying labors than myself. We worked together for several years at the same table in the poop cabin of the *Beagle*, during her celebrated voyage, he with his microscope and myself at the charts. It was often a very lively end of the little craft, and distressingly so to my old friend who suffered greatly from sea-sickness. After perhaps an hour's work he would say to me, "Old fellow, I must take the horizontal for it," that being the best relief position from ship motion; a stretch out on one side of the table for some time would enable him to resume his labors for a while, when he had again to lie down. It was distressing to witness this early sacrifice of Mr Darwin's health, who afterwards seriously felt the ill effect of the *Beagle's* voyage.

The physical fatigue to which Darwin subjected himself when

on shore at the various ports where the *Beagle* stopped was very great; his incessant activity and the desire to see and know everything impelled him to take long journeys which often involved very great hardships. From Rio he started on a horseback journey of a hundred miles; ten hours were sometimes passed in the saddle without rest, and he arrived at the end thoroughly exhausted with hunger and fatigue. In the same month he rode seventy miles, and in the next month made a journey of eighty miles. Food was difficult to obtain in traveling through this sparsely-settled country, and he often suffered from hunger. In the following year he rode four hundred miles on horseback through an uninhabited country to Buenos Ayres, climbing rugged mountains, exposed to cold and wet, and living for days on meat alone. Seven days after the completion of this journey he began an excursion to Santa Fé, three hundred miles distant. At the end of six days he arrived at his destination, went to bed with headache, and was not well enough to continue.

Every opportunity was seized to climb high mountains, visit distant localities of interest, and to study the general features of the fauna and flora of every country. At one time he traveled for three hundred miles in an open boat off Tierra del Fuego, but he was always stimulated to increased activity, he says, by the novelty of objects and the chance of achieving success. It was this enthusiasm that urged him during the five years of absence to bear every discomfort and to strain every energy to the uttermost.

It is a curious coincidence that, like two other leaders of science, Charles Darwin and Joseph Dalton Hooker, their close friend Huxley began his scientific career on board one of Her Majesty's ships. Huxley writes:

> Life on board Her Majesty's ships in those days was a very different affair from what it is now, and ours was exceptionally rough, as we were often many months without receiving letters or seeing any civilized peoples besides ourselves. . . . But apart from experiences of

this kind the opportunities afforded for scientific work, to me personally, the cruise was exceedingly valuable. It was good for me to live under sharp discipline; to be down on the realities of existence by living on bare necessities; to find out how extremely well worth living life seemed to be when one woke up from a night's rest on a soft plank, with the sky for canopy, and cocoa and weevilly biscuit the sole prospect for breakfast; and more especially, to learn to work for the sake of what I got for myself out of it, even if all went to the bottom and I with it.

The effect of these hardships upon health was quite different in the case of the two men, Huxley and Darwin.

2. *Continued Work after the Beagle Voyage.*— The discomforts, fatigues, and mental overstrain of the *Beagle* voyage can fairly be set down as the initial cause of Darwin's subsequent invalidism. Were these causes sufficient to produce such a train of serious and long-continued symptoms? A closer examination of the details of Darwin's life with the clues here given will convince the most doubting that when he landed in England his nervous system was exhausted and that he was in need of immediate and prolonged rest and recuperation. But he took no such rest. On arriving in London he at once began a life which he speaks of as the most active he had ever spent, when he worked "as hard as he possibly could" although interrupted by frequently recurring illnesses and one long and serious illness. The state of impaired health was now firmly established. From this time the initial causes were continued in the persistent overstrain to which he subjected himself. Although conscious of weariness, he continued to tax his nervous system to the utmost, and even beyond its strength. The necessary result of all this was to multiply many times the original acquired exhaustion and to create a condition that was permanent and from which he never fully recovered.

To give some idea of the sufficiency of the causes in Darwin's life after his return, to cause the symptoms that have been enumerated, I will briefly mention some of the work done by him.

He began almost immediately in July, 1837, having returned

in October, 1836, to take notes in relation to the origin of species, and this work was continued uninterruptedly for the next twenty years. He began the book on *Coral Reefs* which caused him twenty months of hard work. He also, while residing in London, read papers before the Geological Society on the *Erratic Boulders of South America*, on *Earthquakes*, and on the *Formation of Mould by the Agency of Earth Worms*. He superintended also the publication of the *Zoölogy of the Voyage of the Beagle*. His three geological books, *Coral Reefs* included, "consumed four and a half years of steady work." After reaching Down he began work on the subject of *Cirripedia;* this work, in two thick volumes and two thin quartos, required eight years to finish. Two years of the eight, however, were lost by illness. From September, 1854, he devoted his whole time to collecting and arranging notes on the origin of species and to reading books, journals, and transactions bearing on the subject. In November, 1859, was published *The Origin of Species;* this book cost him, he says, thirteen months and ten days of hard labor. During this and the following five years he published seven papers on botanical subjects. One paper alone required four months of work. The *Variation of Animals and Plants under Domestication* appeared in 1868 and cost him, he says, four years and two months of hard labor. *The Descent of Man* was published in February, 1871; this book took him three years to write, constant interruptions occurring from ill health and from the frequent demands for new editions and minor works.

During his lifetime Darwin was the author of twenty-three distinct and important works. This does not include new editions and reviews nor the works which he edited and superintended through the press. He also published fifty-one papers and communications to scientific journals. Nine books by other authors contain contributions by him.

Week-days and Sundays were alike; there was no break in the regularity of his life. The pains he took in the preparation of his

manuscript was remarkable; composition was not easy with him, and everything was prepared in the rough and then rewritten and the style and phraseology corrected.

Besides the collecting of material and the writing of books he was in constant correspondence with friends, men of science all over the world, and with all sorts and conditions of men to obtain information to help him in solving the question of the transmutation of species. This correspondence involved much fatigue and required much of his time.

Those who have read *The Origin of Species*, *The Descent of Man*, or *The Expression of the Emotions in Man and Animals* can appreciate the time and labor spent by Darwin in the accumulation of facts by extensive reading, correspondence, and observation.

NATURE OF DARWIN'S ILLNESS; INFORMATION DERIVED FROM THE EFFECTS OF TREATMENT

Much light is thrown on the nature of Darwin's illness by the enforced remedial measures that were adopted by himself in order to enable him to continue his work and to prevent a complete breakdown. There is also something to be learned from the effect of the treatment suggested by physicians.

During Darwin's residence of three years and eight months in London he worked very hard, as has been stated, completing his book on *Coral Reefs*, reading extensively, and preparing papers on various scientific subjects; the systematic collecting of facts bearing upon the origin of species was also continued. He also went into general society, attended as regularly as he could the meetings of several scientific bodies, and acted as secretary to the Geological Society. This exacting work and especially the demands of ordinary social life had so bad an effect upon his health that he decided to abandon London and live in the country. Very little is known as to what part a physician's advice played in this important decision, but from the fact that about this time he consulted Sir Andrew Clark, who advised complete rest from

work, it is probable that the removal to the country was a measure of compromise, securing a certain amount of rest and freedom from many fatiguing obligations with the ability to continue his projected task. At Down he escaped all the social distractions and interruptions that must have worn upon him so much in city life. There was very little real gain, however, from the change. He adopted a daily routine, and made an effort to go a little into society and to receive friends, but the more serious nervous disturbances that have been spoken of soon appeared. One thing after another in his social life was given up—dinner parties, the visits of friends, and excursions to London—so that finally his life became devoted to scientific work only, which, to use his own words, was "his chief enjoyment and sole employment."

The increase of weakness and sleeplessness with other nervous symptoms and their relation to the number of hours spent in work convinced Darwin that he could not keep up his early habits of work, and that in order to preserve a minimum amount of health it would be necessary to reduce the number of hours given to writing. Acting upon this idea he began the habit, which he continued throughout the remainder of his life, of devoting not more than two to four hours daily to actual work in his library. His son gives the following description of his father's daily routine:

> He rose early chiefly because he could not lie in bed, and I think he would have liked to get up earlier than he did. He took a short turn before breakfast. . . . After breakfast alone about 7:45, he went to work at once, considering the one and a half hour between 8 and 9:30 one of his best working times. At 9:30 he came into the drawing room for his letters—rejoicing if the post was a light one and being sometimes much worried if it was not. He would then hear any family letters read aloud as he lay on the sofa.
>
> The reading aloud, which also included part of a novel, lasted until half past ten, when he went back to work until twelve or a quarter past. By this time he considered his day's work over and would often say, in a satisfied voice, "I've done a good day's work." He then went out of doors whether it was wet or fine.
>
> The midday walk began by a call at the greenhouse; then he went

on for his constitutional—either round the sand-walk or outside his own grounds in the immediate neighborhood of the house. . . . He took as many turns as he felt the strength for. . . . Luncheon at Down came after his midday walk. . . . After his lunch he read the newspaper, lying on the sofa in the drawing room. . . . I think the paper was the only non-scientific matter that he read to himself. Everything else . . . was read aloud to him.

After he had read his paper came his time for writing letters. . . . When letters were finished about three in the afternoon, he rested in his bed room lying on the sofa smoking a cigarette and listening to a novel or other book not scientific. . . . The reading aloud often sent him to sleep. . . . He came down at 4 o'clock to dress for his walk and he was so regular that one might be quite certain it was within a few minutes of four, when his descending steps were heard.

From half past four to half past five, he worked; then he came to the drawing room and was idle until it was time (about 6) to go up for another rest with novel reading and a cigarette.

Latterly he gave up late dinner and had a simple tea at half past seven. . . . with an egg or a small piece of meat. . . . After dinner he played backgammon with my mother, two games being played every night. . . . He became extremely animated over these games, bitterly lamenting his bad luck and exploding with exaggerated mock anger at my mother's good fortune. After backgammon he read some scientific book to himself and afterwards there was some reading aloud.

He became much tired in the evening, especially of late years. He left the drawing room about ten, going to bed at half past ten. The restless nights which followed have already been described.

I have quoted in full this record of Darwin's daily routine, as it shows that he lived always under a modified form of rest treatment, just such as is now advised for cases like his.

The day's program was as follows: 7:45, breakfast; 8 to 9:30, work in his study; 9:30 to 10:30, rest in the recumbent position with reading aloud; 10:30 to 12, work in his study; 12 to 12:30, short walk out of doors; 12:30, luncheon; 1:30 to 2, rest in the recumbent position; 2 to 3, writing of letters; 3 to 4, rest lying down in bedroom, with reading aloud and sleep; 4 to 4:30, a short walk out of doors; 4:30 to 5:30, work in his study; 6 to 7, rest in

bedroom and reading aloud; 7, simple supper; 8 to 10, in drawing room, games, reading, etc.; 10:30, in bed.

These rules, it will be seen, allow five hours to what may be called work, including letter-writing, this being divided into four periods of an hour to an hour and a half in length; there were three and a half to four hours of rest during the day, lying down, the time being divided into four periods of about one hour each. There were two short outings of one hour or an hour and a half in the morning and about the same time in the afternoon. Eight hours and a half were spent in bed at night.

I have no doubt that this well-ordered routine was the outcome of many a painful experience. Darwin, we may be sure, discovered early that the alternation of work and complete rest was essential to the prosecution of his studies. The problem was how a man suffering with such symptoms could best continue an arduous life of intense mental application during the many years necessary to complete a great task. Darwin certainly solved the problem; the task was completed in spite of suffering and exhaustion.

If this rule of life, which was the means by which he succeeded, was the result of his own decision, it is only another evidence of his good judgment; if it was the advice of a physician, he must have had a wise counsellor.

Something should be said of certain subsidiary parts of treatment made use of by Darwin — his diversions, holidays, etc. Novel-reading was his great recreation during the hours of rest; even to advanced age he never tired of romances. "A novel," he says in his *Autobiography*, "according to my taste does not come into the first class unless it contains some person whom one can thoroughly love, and if a pretty woman all the better." The conservation of this taste for novels is strange inasmuch as he lost during the latter years of his life all love for poetry, even for that of Shakespeare, in whom he had taken intense delight in his earlier years.

"His only outdoor recreation besides walking was riding,

which he took to on the recommendation of Dr Bence Jones." He continued riding until two accidents upset his nerves so that he was advised to give it up. He was fond of music and singing and was diverted by them after dinner. He smoked in moderation and used wine sparingly.

Holidays were forced upon him by the frequency of "bad days" or by the swimming in his head, which told him he was being overworked. He usually went to London, Coniston, Grasmere, or Southampton, and was rarely absent more than a week.

Much relief was experienced by visits to water-cure establishments. At first he thought that "a cure had been found, but, like all other remedies, it had only a transient effect on him."

I have reserved until the last one of the most important helps that Darwin had. Without the faithful and untiring assistance of his wife and children no work could have been done; otherwise his life would have been a wreck. These women of the family ministered to his hourly needs, brought him food, read to him, warded off all annoyances, and in his daily life kept in quiet motion the machinery that was absolutely essential to his needs. No tribute to Darwin's accomplished tasks can justly omit to give this credit to those who did so much to preserve his strength during these many trying years.

The conclusion to be drawn from the consideration of the influences favorable to Darwin's health is that he was benefited by lessening his work and increasing his rest. He was enabled to live and to prevent the breaking of his thread of life only by relieving the tension at the critical moment.

CONCLUSION

After this review of Darwin's symptoms and of the conditions that preceded and accompanied them, as well as of the modifications they underwent under the influence of work and rest, there can be but little difficulty in reaching a conclusion as to their nature. This conclusion may be expressed as follows:

1. Darwin was strong and in perfect health up to the beginning of the *Beagle* voyage.

2. The history of the voyage shows that all the conditions were such as to lead to an overstrain of the brain and nervous system and that his expenditure of energy was in excess of the normal supply. The mind was overtaxed with excess of work and the body was fatigued by discomforts and extreme exertions.

3. After returning home he continued to be subjected to mental overstrain during the remainder of his life, a period of forty-six years. There was during this time the intense and sustained application of the mind to a series of investigations requiring the exercise of faculties of the highest order as well as the greatest energy and physical endurance.

4. A state of disease characterized by symptoms connected with the brain and nervous system, the digestion, and the heart was manifested on his return to England. These symptoms were intensified as the years went by, and although sometimes lessened they were never entirely relieved, their fluctuations bearing a close relation to the alternations of rest and work. In their general character they belong to the category of "fatigue symptoms" and were due to the continued overstrain of exhausted nerve cells. They never, however, rendered the cerebrum incapable of the highest intellectual work, although making the accomplishment of this work both painful and difficult.

5. The disease did not consist of any gross lesions of the brain, spinal cord, or nerves, inasmuch as there were no symptoms of any such change. Moreover, the symptoms continued without great alteration during thirty-six years, and under the influence of rest and proper diet improved greatly toward the end of life. This could not have happened had there been any organic nervous disease.

6. The disease was clearly not due to any organic change outside of the nervous system. The chronic indigestion and disturbances in the action of the heart were the usual well-recog-

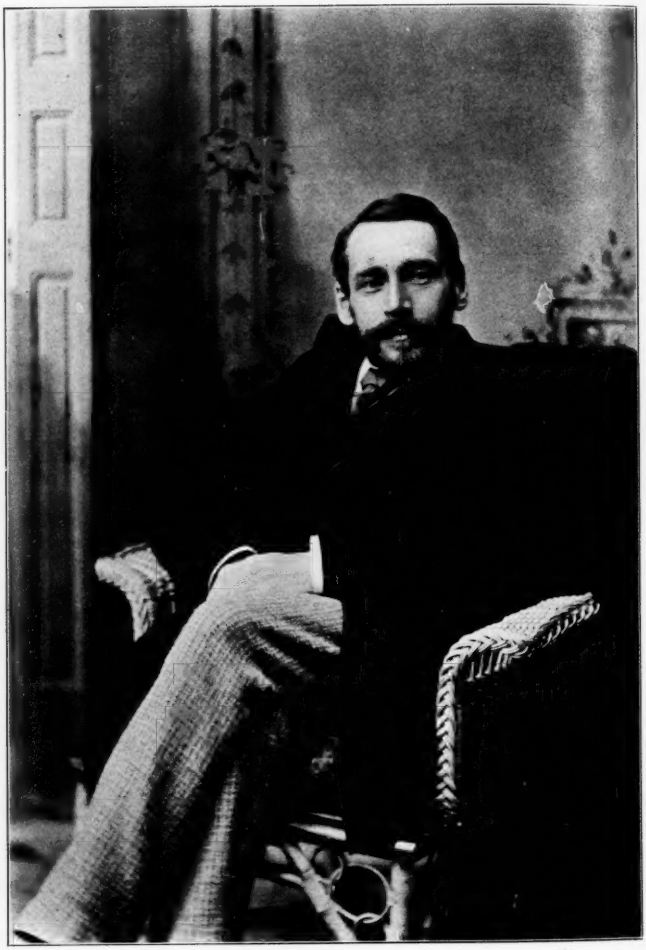
nized accompaniments of loss of the normal nerve supply to the digestive organs and the heart.

7. The symptoms that preceded death were manifestly due to senile arterio-sclerotic changes, leading ultimately to heart exhaustion and angina pectoris and hastened no doubt by the life of excessive labor. They did not exist, however, before the oncoming of old age. The early symptoms connected with the heart were the result of the disease of the nervous system, not of any organic change in the heart or arteries.

8. The final conclusion is that Darwin's disease was chronic neurasthenia of a severe grade due first to the overstrain of the *Beagle* voyage and second to the life of hard intellectual work begun in 1837 and continued until 1882.

If this diagnosis be the correct one, and of this I think there can be no doubt, could the result have been different from what it was? Was it possible to have prevented all this suffering? The nature of Darwin's work and of Darwin himself necessarily would have made his labor of production a painful one. Such great original thoughts could not have been born without some agony. And yet if Darwin had on his return from the voyage given up all work for one year, two years if necessary, and had lived a life of rest and diversion, free from the daily toil of writing books, correcting proofs, and correspondence, I believe a cure would have been brought about and his subsequent life more filled with joy and alleviation than it was. It will be said with some truth that Darwin's brain could not be made to rest, that in the Alps or on the Riviera he still would have been the observer and worker. But if rest and relaxation had been enjoined upon him as a duty, a relative rest could have been had, free at least from the demands of the printer and of his own exacting conscience.

It is too late now to regret that this course was not adopted and that so much suffering followed its neglect. It only enhances the value of Darwin's work to know that the truth as it came from him was created for us and for all posterity at so great a cost.



GEORGE MERCER DAWSON

GEORGE MERCER DAWSON

GEORGE M. DAWSON, C.M.G., LL.D., F.R.S., Director of the Geological Survey of Canada and an editor of the *American Anthropologist*, died on March 2, in his fifty-second year, of acute bronchitis, after an illness of but a few hours. In his death Canada loses her leading scientist, and North America one of her foremost geologists.

George Mercer Dawson was born at Pictou, Nova Scotia, August 1, 1849. His father, Sir J. William Dawson (who died in 1899), long known as principal of McGill University and still more widely known as the author of standard works on geology, archeology, and related topics, was Canada's most eminent scientist for decades; his mother, Lady Dawson (Margaret A. Y. Mercer), representative of a distinguished Edinburgh family, still occupies a prominent place in that scientific and educational circle in Montreal which grew up under the influence of her honored husband. Born with the best physical and intellectual endowments, young Dawson suffered a nearly fatal accident (involving a fracture of the spine) in infancy, which arrested bodily growth and resulted in permanent deformity; yet the misfortune was so far counteracted by early treatment and training, and so far overcome later by inherent vigor, that its victim achieved distinction in his maturity as one of Canada's hardiest explorers, while his intellectual accomplishments could hardly have been enhanced by any physical advantages.

Dawson's earlier education was acquired partly in Montreal, partly in Edinburgh; later he took a partial course in McGill University, followed by a course in the Royal School of Mines (London), 1869–1872, where he not only graduated with honors but took

the Duke of Cornwall scholarship and the Edward Forbes prize, and received the highly-prized title of Associate. Returning to Canada, he began original researches in geology. In 1873 he was appointed geologist and botanist of the British North American Boundary Commission, and his report is one of the classics of Canadian geology. In 1875 he was appointed on the staff of the Canadian Geological Survey, and entered on a remarkable career of exploration of northwestern North America; his work including extended reconnaissances of the Liard and Yukon valleys, of the Canadian Rocky mountains, and of British Columbia. During these travels and researches he came in frequent contact with aboriginal tribes, and did excellent work in recording their characteristics and customs and in collecting their languages. In 1883 he was made Assistant Director of the Geological Survey Department; in 1891 he became a fellow of the Royal Society of England, and during the same year received the Bigsby medal for eminent researches in geology. In 1891 and 1892 he served as one of the British Bering Sea Commissioners, for which service he was decorated by the late Queen and Empress Victoria with the order of Companion of Saint Michael and Saint George; and about the same time degrees were conferred on him by McGill University and Queen's College. In 1893 he was elected president of the Royal Society of Canada; on the retirement of Sir Alfred Selwyn in 1895, he was appointed Director of the Geological Survey; and when an Ethnological Survey of Canada (modeled after the Ethnographical Survey of the United Kingdom and thus after the Bureau of American Ethnology) was instituted in 1896, he was placed at the head of the Survey Committee.

It falls to few men to have so many high honors and grave responsibilities thrust on them in so short a period; the succession is probably without parallel in Canada's history; yet it is the common judgment that the honors were fully merited, the responsibilities borne in such manner as to add renown to the country and the crown. Dr Dawson's career was a credit to Canada, and

an eloquent testimony to the wisdom of the nation in recognizing and utilizing the talents of her sons.

One of Dr Dawson's earliest contributions to ethnology was a memoir on the Haida Indians of Queen Charlotte islands, published in the form of an appendix to the Report of the Geological Survey of Canada for 1878–79 (pp. 103–189, pls. III–XIV); a contribution made noteworthy by the novelty and extent of the observations and the comprehensiveness of the record. Four years later he, in association with W. Fraser Tolmie, prepared a valuable series of "Comparative Vocabularies of the Indian Tribes of British Columbia, with a Map Illustrating Distribution," which were published by the Geological Survey in 1884; and he appended a valuable series of notes on the aborigines of the Yukon district and adjacent territory to the Survey Report of 1887–88 (pp. 191–213). About the same time he prepared for the Royal Society of Canada a memoir on the Kwakiutl people of Vancouver island and adjacent coasts, with an extended vocabulary (Trans. Roy. Soc. Can., vol. V, sec. II, 1887, pp. 1–36, with plate); and still more comprehensive was his subsequent memoir entitled "Notes on the Shuswap People of British Columbia" (ibid., vol. IX, sec. II, 1891, pp. 3–44, pl. VI). A "Note on the Occurrence of Jade in British Columbia, and its Employment by the Natives" was published in 1887 in the *Canadian Record of Science;* and a summary sketch of the "Past and Present Condition of the Indians of Canada" appeared in the *Canadian Naturalist*, vol. IX, 1881. In 1884 the British Association for the Advancement of Science appointed a committee to investigate the physical characters, languages, and industrial and social condition of the northwestern tribes of Canada, of which committee Dr Dawson was made a member; and by reason of previous familiarity with the subject, acquaintance with territory and tribes, and presence on the ground, it naturally fell mainly to him to organize and administer the work of the committee. The work was carried forward with great economy under small grants, and the reports of the collaborators (among whom

Dr Boas deserves especial mention) were published annually up to the institution of the more formal survey in 1896.

While several of Dr Dawson's titles and the prefatory remarks in some of his papers imply that his ethnologic researches were subsidiary to his geologic work, and while his busy life never afforded opportunity for monographic treatment of Canada's aborigines, it is nevertheless true that he made original observations and records of standard value, that much of his work is still unique, and that his contributions, both personal and indirect, materially enlarged knowledge of our native tribes. It is well within bounds to say that, in addition to his other gifts to knowledge, George M. Dawson was one of Canada's foremost contributors to ethnology, and one of that handful of original observers whose work affords the foundation for scientific knowledge of the North American natives.

Primarily a geologist, Dawson did his work in such wise as to aid in the solution of fundamental problems in archeology, and so to illumine various aspects of anthropology. When he returned from the Royal School of Mines to the land of his nativity, he found the geologists of Canada and the United States at issue concerning the later periods and episodes of geologic history. The differences were natural; they grew out of the fact that each group of earth-students began with the phenomena of their respective fields—those of Canada with late-glacial, aqueo-glacial, and glacial deposits only, those of the United States with earlier glacial deposits chiefly—and extended inference too far into the neighboring field; yet the differences were none the less unfortunate and obstructive of progress. Young Dawson wisely avoided controversy, but gradually extended observation over the more northerly field, gradually systemized knowledge of the Pleistocene history of the northland, gradually brought the stern logic of facts to bear on the general interpretations, and in this manner contributed more than any associate—probably more than any contemporary—toward harmonizing the discrepant readings of the

records of rocks and ice. Today the leading geologists of Canada and northern United States are practically at one as to the later episodes of earth-making; they are in substantial agreement as to the geologic time-scale by which the antiquity of man on the western hemisphere is to be measured; and for this happy condition they are indebted to no one more than the sagacious and far-sighted student whose untimely end they are united in mourning.

Time was when progress was mainly material, and when he who made two blades of grass to grow where one grew before was a great human benefactor; now horizons have widened, and progress has changed its course so far that he who sows ideas and harvests knowledge is coming to be reckoned among the greatest of benefactors. Of such was Dawson's work; gaining broader knowledge of his country than any predecessor, he gathered the wide-spreading strands in single grasp; writing treatises on geologic history among the most masterly ever penned, he was able to look from the past through the present and into the future far more clearly than most of his fellows; so his surveys of natural resources and possible utilizations contributed in unexcelled degree to the welfare of his nation and others, while the light of his knowledge and the radiance of his example have raised in due measure the intellectual plane of the western world.

Dawson was one of the men who left the world better because he lived in it.

W J M.

BOOK REVIEWS

Symbolism of the Huichol Indians. By CARL LUMHOLTZ. (Memoirs of the American Museum of Natural History, Volume III. Anthropology II.) New York : May, 1900. 4°, 228 pp.

This latest work of the distinguished explorer and ethnologist, Dr Carl Lumholtz, is one of the splendid series of *Memoirs* in course of publication by the American Museum of Natural History, New York, and embodies a portion of the results of extended studies, beginning in 1895, among the Huichol Indians, an agricultural Nahuatlan tribe, numbering now about 4000 souls, residing in the heart of the Sierra Madre, in the state of Jalisco, southern Mexico. If "mountaineers are always free," so also are they conservative, and to the forbidding and inaccessible nature of their country is due the fortunate fact that, while so many other native civilizations have long since been wiped out by the conqueror, the Huichol have been able to preserve their system intact until it could be studied and presented to the world by so competent an authority as Dr Lumholtz.

Notwithstanding its attractiveness, the subject of symbolism is always a dangerous one to handle, by reason of the constant temptation to theorize on hidden meanings and to interpret simple facts from the occult standpoint. Of such speculation run wild, Adair's celebrated work on the southern tribes is a conspicuous example. It is pleasant to find that the Doctor's scientific training and experience have enabled him to avoid this error, and from his remarks on page 211 concerning "a strong tendency to see analogies," it is evident that he has learned, what some investigators fail to remember, that mysticism feeds upon itself, and that much that is set down as symbolism has its origin in the mental vagary of the individual informant and is no part of any recognized system.

After an introductory sketch of the Huichol tribe and territory the author treats successively of Gods and Their Paraphernalia, Ceremonial Arrows, Front Shields, Back Shields, "Eyes," Votive Bowls, The Ark of the Deluge Legend, The Shaman's Plumes, etc., Facial Paintings, and Miscellaneous Symbolic Objects, followed by a summary of conclusions, indexes to the prayers, symbols, objects, and ideas.

The gods have fixed relationships; thus we have Father Sun, Grandfather Fire, and Great-grandfather Deertail. Their images are kept, not in the temples consecrated to them, but in remote secret places, usually caves in the mountains. In their symbolic presentation the gods are seen most commonly as serpents, frequently also as eagles or hawks, or as the sacred *hikuli* (peyote) plant. These symbolic forms are in large measure interchangeable and thus practically narrowed down to the one great symbol of the serpent, whose image the Huichol sees in every phenomenon of nature—the rain, the fire, the clouds, the wind, the ripples on the water, and the waving tree-tops.

The temples, of which there are nineteen in the Huichol country, are large circular houses of stone, with doorways facing to the east, and thatched roofs which are removed every five years, five being the sacred number in the tribe. Although no sacred images are kept in these temples, to which the people constantly resort for prayer and sacrifice, yet the gods are always present invisibly, and stools and chairs are kept there for their convenience, each seat being decorated in accordance with the taste and office of the deity for whose use it is designed. Diminutive votive offerings are also attached to them by the suppliants as reminders of the particular blessings desired.

Ceremonial arrows, in a great variety of forms, are inseparably connected with the religious life of the Huichol, one or more being sacrificed for each individual at least once a year. "The arrow, as an expression of prayer, answers to all the wants of the Indian from the cradle to the grave. There is no symbolic object in more common use, either by the private individual and the family or by the community, as represented by the officers of the temple. No feast can be imagined without the presence of arrows. Whenever an Indian wants to pray, his first impulse is to make an arrow. The sacrifice of one or more arrows expresses his desires in a language intelligible to him and to the gods." These sacrifice arrows are placed upright in the ground, stuck into the seats of the sacred chairs in the temples or into the thatch of the roofs; are deposited in sacred caves, at sacred springs, and other places; in lonely spots in the mountains, or even thrown into the sea—"in short, everywhere where some god lives whom the imaginative Huichol may implore and appease, for the arrow stands for him personally, or for the tribe, praying its silent prayers." In all this we see a close parallel to the prayer-feather of the Hopi.

The front and back shields are respectively symbolic types of the ancient war shield or buckler, and of the woven mat carried on the warrior's back, to serve both as a body armor and a bed. The front

shields are generally round, while the back shields are rectangular, both being elaborately designed and decorated according to the various purposes for which they are intended. As an illustration it is noted that in order to prevent the rain going from their country to that of a neighboring tribe, the Huichol placed in the middle of the trails leading out of their territory a number of back shields upon which fierce animals were pictured, the idea being that the (living) rain would thus be frightened and compelled to turn back. To counteract the spell their neighbors made it a business to destroy these shields wherever they found them. Detailed description is given of the make-up and use of a large number of shields of both kinds.

The "eye" (*sikuli*) may briefly be described as a small mat set diagonally in the center of a small cross upon which it is woven, the details varying according to the god and the purpose. In a special manner it symbolizes the understanding of unknown things. Such "eyes" are sacrificed in large numbers to insure the health of young children. Votive bowls are ordinary drinking gourds specially ornamented with symbolic beaded designs to serve as sacrifices to the gods. They are smeared with blood and deposited in the temples.

The Huichol have a deluge myth in which one man is preserved in a peculiar box or ark, together with a black she-dog, who afterward becomes a woman, by which means the world is repeopled. Representations of this ark are sometimes made and deposited in certain places as sacrifices to obtain help in great emergencies. Such an ark was once fished out from a lake far to the south of the Huichol country, having been left there by some of the tribe "as one of the extreme means of getting rain," in accord with an Indian idea that what has once been connected with an effect has the power of reproducing that effect; hence, that the ark could bring rain.

Plumed wands are in constant use in ceremonies and conjurations. Sacred cakes of meal, in various fanciful shapes, are also sacrificed to the gods, and are sometimes tied in festoons about the temple until after the conclusion of the ceremony, when they are eaten by the priests or distributed to the people. Of curious interest are the talismanic rock crystals, which are regarded as "astral bodies" of dead or even living persons. Says Lumholtz: "In the collection I have a father and a mother, a grandfather and a grandmother, of the Indian who sold them to me." The stones are carefully laid away and fed at intervals with the blood of game, like the Ulûñsûti of the Cherokee.

Much symbolism attaches also to certain drums, sandals, scepters, bannerets, sea-shells, and flowers, and to certain stuffed animal skins,

notably that of the gray squirrel, which in the primeval time was the protector of the Child Sun. Around the neck of the sacred squirrel-skin are sometimes tied the cocoons of a species of moth found in the eastern country. "These cocoons, which are those of a night animal, —their beds, in which they sleep before coming to life again,—are supposed to be the dreams of the gray squirrel, by which he is guided."

Considerable space is devoted to facial paintings and miscellaneous symbolic objects, while the concluding chapter is a valuable summary of the whole subject, as deduced from the objects and the explanations given by the Indians themselves. Of special value are the appendices, index of prayers, index of symbols, and index of objects and ideas. Throughout the volume are numerous references to the great *hikuli* or peyote cult, which dominates the religious thought of all the tribes of the plains and central plateau from the Arkansas river to the City of Mexico.

The author calls attention to close analogies with beliefs and customs in other tribes, particularly in Mexico and among the more northern Pueblos, and says: "Such phenomena should not cause surprise, as researches tend more and more to convince us of the similarity of Indian thought, under similar conditions." He might have gone farther and predicted that the final result will show a regular and unbroken connection in native cult and culture from the arctic regions to the tropics, of which the ancient systems of Mexico and Yucatan are but the highest development.

From cover to cover the volume is filled with curious information, brought together with painstaking and discriminating care, upon an intricate subject concerning which little that is authentic has hitherto been published.

On page 110 the Doctor says: "To the Indian the Sun, of course, is a man." He probably means a *person*, as with many tribes the Sun is a woman, as it was with the ancient Germans (*die Sonne*).

The illustrations from drawings by Mr Rudolf Weber, with the maps and splendid colored plates, are in keeping with the general excellence of all the publications sent out from the American Museum.

JAMES MOONEY.

The Political Economy of Humanism. By HENRY WOOD. Boston: Lee & Shepard, 1901. 12°, 319 pp.

This book is not a formal treatise in which the principles of political economy are systematically presented, but may be regarded rather as a series of essays on economic questions of current interest, the

discussion of principles being subsidiary to the presentation of the author's views on these questions. Among the subjects treated are Combinations of capital, Combinations of labor, Governmental arbitration, Economic legislation and its proper limits, Socialism as a political system, Wealth and its unequal distribution, The law of centralization, "Booms" and panics, Money and coinage, Tariffs and protection, The modern corporation, The abuse of corporate management, The evolution of the railroad, Gold production and values, and Social experiments in Australasia.

The author's general attitude is that of opposition to governmental interference in industrial affairs. In his chapter on Economic legislation and its proper limits, he says:

"As fundamental principles we may conclude first, that the State should not interfere in any enterprise that may be as efficiently carried on by private control; second, that it should leave all questions of prices, rates, wages, and hours, to the natural regulation of free and untrammeled conditions."

He admits, however, that as the supply of water and light in a municipality involves the use of the public streets, it must at least be subject to public regulation, and apparently regards municipal ownership of waterworks and lighting plants as possibly advisable in some cases. A protective tariff is in conflict with the principle he favors, but however objectionable it may be from a cosmopolitan, it is, he thinks, expedient from a national point of view. In his opinion the question of higher or lower duties on imported commodities is in most cases a matter of much less importance than their respective advocates imagine; while, on the other hand, the changes and uncertainties due to the position of the tariff as a party issue are a cause of serious harm. An ideal tariff, he thinks, is not to be expected as the result of legislation enacted amidst the influences brought to bear upon legislators by a multitude of local interests; but "a commission of economic experts . . . formed with a single aim for justice and the public welfare, occupying an American standpoint, and uninfluenced by political ties and questions of party advantage . . . would be able to outline a very perfect revenue system."

The prevalent disposition to regard great organizations like the Western Union Telegraph Company as dangerous monopolies is set down by this writer as a prejudice in which "there may be more danger . . . than in the organizations themselves." There is, he says, "what may be called a normal rate" for telegraphic service, "and in case the management make a tariff above this point, demand falls off

and profits shrink with as much certainty as they would in case it were put below it." This would be very reassuring if satisfactory evidence were supplied that this so-called "normal rate" will be one that is fair to the public. No such evidence is, however, presented. That there *is* a rate at which the profits of the company will be larger than they would at any other, whether lower or higher, may be freely granted, and the company's managers may probably be trusted to learn by experience what that rate is and not to fix their charges at any higher and less profitable level. But the point of real importance is whether this rate of maximum profit is also a fair one, and upon this point no light whatever is thrown by the mere act of calling the rate in question a "normal" one, however appropriate that name may appear from the point of view of the shareholders and managers of the corporation.

Of the results of social experiments in Australasia the author takes a more pessimistic view than the facts seem to warrant. For example, on page 307 he speaks of the "merely nominal increase, or in many cases the positive decrease, in the population of a vast undeveloped domain like Australasia, which should naturally be in the enjoyment of youthful and vigorous growth." In point of fact, the increase in population for the seven colonies during the nine years 1891–99 amounted to 697,850, or 18.4 per cent, a rate which exceeds 20 per cent per decade. While this rate is not so high as that of several earlier periods, it can hardly be considered low, in view of the great distance of these colonies from the countries on which they depend for their immigrants, especially when it is remembered that a period of industrial depression following a financial crisis, and aggravated by two or three successive seasons of severe drought, had given a check to immigration—a check which it would, however, be premature to regard as more than temporary. The "merely nominal" increase which, in the same paragraph, he declares is occurring in the population of New Zealand amounted during the nine years ending with 1899 to about 21 per cent. This rate of increase is more than twice as great as that of Germany for a like number of years in the last decade for which statistics are at hand; and among European countries Germany holds a high rank in respect to the rapid increase of her population. The large number of emigrants from Victoria—"mostly able-bodied men"—to which he calls attention in the same connection appears at first glance somewhat startling; but when it is remembered that Victoria is a mining colony, and when it is found on further investigation that the extraordinary movement of population referred to consisted mainly in a large migration—"mostly of able-bodied men"—from the Victorian

mining districts to the newly discovered and productive gold-fields of Western Australia, it immediately becomes apparent that this movement is not of a character to threaten the depopulation of Australasia.

In respect to the literary style of the book under review, it may be said that a lack of precision in the use of words is often noticeable. For example, on page 302 the author speaks of "calm and accurate information," where he apparently means accurate information calmly considered. In another place he introduces a table as a "table estimated from reports of the Mint Bureau," the fact apparently being that the table in question was either copied or compiled from those reports. The inexact use of English illustrated in these instances and in many others that might be pointed out is scarcely indicative of the clear and careful thinking necessary to the proper treatment of such subjects as the author undertakes to discuss; yet his book is undeniably interesting and intelligently critical readers may find it sufficiently suggestive to repay perusal. EDWARD T. PETERS.

Vergleichende Studien zur Stellung der Frau im Alterthum. Erster Band. *Die Frau im Talmud.* NAUM KLUGMANN. Vienna: 1898.

The sources upon which the study of the position of woman in Jewish antiquity is based are the Bible and the Rabbinical literature (Talmud and Midrash), inasmuch as they contain either special ordinances and regulations relating to the status of woman, or incidental estimates of woman's nature and character.

To begin with the beginning, the birth of a daughter was in general not hailed with the same joy as that of a son; still the baby girl was nevertheless welcomed into the family and cherished with the same tender care as the boy. There was even a preference for the female as first child. Infanticide and exposing were unheard of in Judaism. A father in great straits, after he had disposed of his real and personal property, could sell his daughter, before she attained puberty, *i. e.*, the twelfth year of age, into servitude, but then only under condition that either her master or his son should subsequently marry her — a condition which, by the way, throws a significant light on the thoroughly democratic spirit which prevailed in Israel. Otherwise she became free on attaining maturity, nor could she be given another master by her father.

In the education of the daughter the training in housework occupied the most important part. Intellectual pursuits were not encouraged,— were even frowned upon by some of the Rabbis. "Woman's wisdom is

limited to the spindle," is one of the ungallant Rabbinical sayings. Still they were not absolutely discouraged or shut out from woman's reach. Alongside with the saying quoted above are met in the Talmud such sayings as: "It is the duty of every one to instruct his daughter," and "The study of Greek wisdom is an ornament to women." And as a matter of fact not only did women grace public festivals with singing, playing of instruments, and dancing, but the Bible knows of prophetesses and poetesses, and in the Talmud several women are introduced for their learning and high intellectual attainments.

Passing over to the condition of woman in married life, there is to be pointed out the unique position of the Jewish daughter in that her father could not dispose of her hand and heart according to his pleasure, but that her consent was necessary in marriage. On the other hand it is well known that the Jewish lawgivers sanctioned, or at least accepted as *de facto* institutions, both polygamy and divorce. And while it may be assumed that the former came more and more into desuetude in Talmudic times, the general trend of the Rabbinical legislature was to facilitate the latter, and we can not join the author in his enthusiasm over it. There might be quoted touching warnings by the Rabbis against divorce; whether they palliated the effect of the liberal laws in practice is withdrawn from our knowledge. As wife the Jewish woman was the subordinate but honored and cherished helpmate of the husband. Honoring of one's wife is enjoined by the Talmud as the condition of securing the blessing of God. "One should eat and drink under his income, dress according to his income, but honor his wife above his income." And while she was to work and manage the house, she was not to be a drudge. One Rabbi forbids heavy work to woman, as it may impair her sexual functions.

The widow, and for that matter also the divorced woman, was perfectly *sui juris* and could marry again. The former, so long as she remained in the widowed state, was to be supported from the estate left by the deceased husband. It might be added that to judge from many expressions in Bible and Talmud, such as for instance, "God is the judge of widows," a widow was an object of special care and consideration in the Jewish community.

It can be said, after considering all the utterances relating to woman in Jewish literature, that the position of woman among the ancient Jews was a comparatively high and dignified one. She had no "equal rights" with man, her sphere of life and activity was limited — to the home; but within this sphere she moved freely and was the mistress, not the slave. The proprietary rights over the female members of the

family accorded to man among the ancient peoples, as also the institutions of the Asiatic harem and the Greek *gyneconitis*, were unknown among the Jews. The intercourse between both sexes was comparatively free. In the incidental and proverbial sayings about woman there are as many and as keen satirical shafts directed against her as in the literature of any other people. But the Jew, it seems, was not only by temperament averse to harshness against his daughters and wives, but was also deeply imbued with the worth and mission of woman as wife and mother; as one Rabbi says: "Thy wife is thy family."

I. M. CASANOWICZ.

Tanz Objecte vom Bismarck Archipel., Nissan und Buka. W. FOY. (Pub. aus dem Königl. Ethnog. Museum, Band XIII.) Dresden: Stengel & Co., 1900. Folio, 40 pp., 17 pl., 2 figs.

Of the thirteen volumes in the folio series published by the Royal Ethnographic Museum in Dresden, under the direction of Dr A. B. Meyer, ten are devoted to southeastern Asia and the archipelagos adjoining. Since our own country, having made an experiment with the African, has adopted a goodly number of dwarfed Papuans, this last-mentioned race will now engage our thoughts, ethnical and political, and Dr Meyer will be our best guide. In the volume here reviewed, the plan of all the others in the series is followed out carefully, namely, of presenting the object, not in lithograph or drawing, but by photographic processes. By this means the museum in Dresden multiplies itself many hundredfold and makes possible a coöperative, institutional research and judgment. The student of Dr Foy's volume will also find that his desire to be in touch with a wide range of authors has been fully anticipated in text and footnotes. Most elaborate tables of contents, indexes, and catalogue numbers for the Dresden Museum leave nothing to be desired.

In 1889 Dr Meyer published Volume VII of the series on *Masks of New Guinea and Bismarck Archipelago*, and in 1895 appeared Volume X, on *Carvings and Masks from Bismarck Archipelago and New Guinea*, by Meyer and Parkinson. In the introduction to Volume XIII will be found an excellent account of studies in masks as ceremonial paraphernalia the world over. The student is cautioned also against too hasty generalizations concerning acculturation through analogies and superficial resemblances. The ingenious and elaborate carving and the weird mixture of color in the masks of the Papuans and their kindred have always had a fascinating interest for the ethnologist. In plate xiii will be found sixty-five motives on mask ornamentation from New

Mecklenburg (New Ireland), all drawn from well-known fishes. The excursus, pages 31–35, devoted to this plate, throws a flood of light on the otherwise hopeless confusion of parts and drawings. The composite Yukon masks, in which all nature is shown to be quickened by the return of the sun, offer a slight parallel, though the Eskimo artist is handicapped by lack of good materials. Farther south the giant cedar holds out its friendly trunk to the wood-carver, and both on it and in it he fixes his spirit life, the art motives as analyzed by Boas being his commonplace activities and associations. So, by means of the descriptions in the text and the elucidation of plate xiii the student of mythology finds out that the Papuan clothes himself in a material symbolism that prays louder than words in the ears of his gods for supplies to his common wants. It may be that the divine benefactors do not understand the jargon of the petitioner, but their eyes can never be deceived when they rest on his elaborate requests in form and color.

O. T. MASON.

Volkstum und Weltmacht in der Geschichte. Von ALBRECHT WIRTH, München : Bruckmann, 1901. 8°, 236 pp.

Volkstum und Weltmacht, " peopledom and worldmight," or, in plain English, the development of nationality and world-powers in history. The author brings together in this volume a number of special studies on the gradual widening of culture as shown in the development of nations and enlarged conquest. Race and forms of civilization have been most active forces in this evolution, working through inner vitality and normal growth, through the union and combination of adjoining cultures and by finally breaking out of bounds and expansion. The study is divided into the following periods, marking also, as it were, epochs of widening :

1. Mesopotamian-Egyptian period..... to 1300 B.C.
2. Classic period.....1300 B.C. to 224 A.D.
3. The Double period, Northern and Southern races unfolding.....224 A.D. to 1250 A.D.
4. The Oceanic period.....1250 A.D. to 1900 A.D.

The larger part of the volume, necessarily, is devoted to the fourth period—the awakening of nations, races, and religions, and to the present as the outcome. The debate on race and culture is continued, and the volume closes with a series of chapters on peoples in relation to the absorption or disappearance of smaller peoples, to territory, to the state, clan feeling, industry, and power. We are called " Jankees " on

page 20, and shall have to get used to it. Again, the national conceit is a little hurt by the fact that the term "United States" does not occur in a book of 236 pages devoted to expansion! O. T. MASON.

Om Kalevala, Finnarnes nationalepos och forskningarna rörande de detsamma. Af K. B. WIKLUND. Stockholm: Norstedt & Sons, 1901. 12°, 39 pp.

This little volume contains a Swedish essay on the Finnish national epic poem, *Kalevala*, and forms number 71 of the publications of the Heimdal Society, the purpose of which is to put in circulation works of popular interest—topics of Swedish and Scandinavian national history and folklore. The Heimdal Society, now in its eighteenth year, is named after one of the principal Norse deities and is composed of a body of students at the University of Upsala. *Kalevala* is not a Scandinavian but a Finnish topic; nevertheless the spirit pervading the poem is such as to interest all inhabitants of the three Norse countries, and the specimen "Trettiosjette runan" gives an idea of Wiklund's own poetic attainments. The contents of the seventy other Heimdal publications, according to the published list, refer to historical characters, as Erik Dahlberg, Gustav II, Gustav Vasa, Gustav Adolf, Alexander the Great, and Luther; and to travels in Sweden, the Dutch in South Africa, and other contemporary matters. A. S. GATSCHET.

Album of Papúa-Types. II. North New Guinea, Bismarck Archipelago, German Salomon Islands. By Dr A. B. MEYER and R. PARKINSON. Dresden: Stengel & Co., 1900. 4°, 4 ll., 15 pp., 53 pl.

This splendid album is supplementary to one (now out of print) prepared by the same authors and published under a similar title in 1894. The excellent photographs were made by Mr Parkinson, while the brief but adequate descriptive text in German and English is from the able pen of Dr Meyer. The 53 heliotype plates, showing some 550 figures, portray various types of the still remarkably primitive indigenes of the regions indicated in the title, together with their dwellings, ghost-houses, mask houses, canoes, etc. As is the case with every publication for which Dr Meyer has been responsible, the mechanical aspect of the album leaves nothing to be desired. F. W. HODGE.

PERIODICAL LITERATURE

CONDUCTED BY DR ALEXANDER F. CHAMBERLAIN

GENERAL

von Andrian (F.) Die Siebenzahl im Geistesleben der Völker. (Corrbl. d. deutschen Ges. f. Anthrop., 1900, XXXI, 96–98.) Brief general discussion of "the evil seven," the mystic and cosmic seven, etc., among the peoples of Asia and Europe, with the conclusion that the "seven-cult" has spread from Mesopotamia over Europe, Asia, parts of Africa and Polynesia. No explanation is offered for its occurrence in certain regions of America.

Bartels (M.) Was können die Toten? (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 117–142.) A critical enumeration, with references to the literature of the subject, of the acts attributed to the dead by the popular mind. Opening the eyes, singing, eating, disease-removing, returning to earth, night-journeying, speaking in prose and in verse, "death-kissing," advice-giving, omniscience.

Bastian (A.) Zum Seelenbegriff in der Ethnologie. (Ethnol. Notizbl., Berlin, 1901, II, 77–97.) A characteristic discussion of primitive conceptions of the soul from the *doyen* of German ethnologists.

Beeton (*Miss* M.), **Yule** (G. V.), and **Pearson** (K.) On the correlation between duration of life and number of offspring. (Proc. Roy. Soc., London, 1900, LXVII, 159–179.) Gives results, with many tables and curves, of study of English and American Quaker mothers and fathers and of fathers in Burke's "Landed Gentry." In both America and England "the influence of longevity on the fertility of the father is greater than its influence on the mother." Another fact brought out is that "American men and women are more alike, and English men and women more alike, than the women to the women, or the men to the men of the two races."

Boas (F.) The mind of primitive man. (Science, N. Y., 1901, N. S. XIII, 281–289.) Address of President of American Folk-Lore Society. Treats of differences between mind of primitive and of civilized man. Author considers it probable that "the wide differences between the manifestations of the human mind in various stages of culture may be due almost entirely to the form of individual experience, which is determined by the geographical and social environment of the individual." A very suggestive address.

Bolton (H. C.) Physics and faith. (Ibid., 241–246.) Address of President of Chemical Society, Washington. Discusses among other things the faith of men of genius in intellectual conceptions.

Brandes (G.) Ueber eine Ursache des Aussterbens einiger diluvialer Säugetiere. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 103–107.) The author takes the view that not the action of man, sparsely distributed over a vast area, but the form of the animal's tusks (disadvantageous to the individual) was a chief cause of the dying out of the mammoth.

Carus (P.) Anubis, Seth, and Christ. (Open Court, Chicago, 1901, XV, 65–97.) This numerously illustrated paper discusses some aspects of the assimilation by early Christianity of pre-Christian ideas.

Chervin (*Dr*) Traditions populaires relatives à la Parole. (Rev. d. Trad. Pop., Paris, 1900, XV, 241–263.) Folklore relating to "tongue-cutting," crying, stammering, mutism, etc.

Culin (S.) The origin of ornament. (Bull. Free Mus. Sci. and Art, Phila., 1900, II, 235–242.) A general argu-

Culin — *Continued.*
ment in favor of the thesis that ornament and adornment "are the products of religious sentiment, of magic and superstition," and are not primarily based upon innate love of the esthetic or sexual attraction.

Cutore (G.) e **Fichera** (G.) Varietà anatomiche riscontrate durante l'anno scolastico 1899–1900. (Arch. p. l'Antrop. e la Etnol., Firenze, 1900, XXX, 55–85.) A good description (with bibliography of 69 titles) of the anatomical variations,—osseous, muscular, arterial, nerves and urinary organs,—observed in the dissecting room of the Anatomical Institute of the University of Catania.

Drechsler (P.) Das Rückwärtszaubern im Volksglauben. (Mitteil. d. Schles. Ges. f. Volkskunde, Breslau, 1900, 45–50.) Examples of belief in the power of "backwards doing" in folk-thought.

Eisler (P.) Ueber die Herkunft und Entstehungsursache des Musculus sternalis. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 150–154.) In this article, with three figures in the text, Dr Eisler argues that the *Musculus sternalis* is an aberration of independent origin (neither prospective nor retrospective) due to the conditions of the sternal region.

Ferraro (G.) La genesi della mitologia meteorica. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 469–481.) The personification of atmospheric phenomena is thought by the author to have a "corporeo-psychic" origin, as seen in primitive peoples and children. Evidence in proof of this. Ferraro considers that the age of two to five in children corresponds to the creation-period of such mythology.

Giuffrida-Ruggeri (*Dr* V.) Ricerche morfologiche e craniometriche nella norma laterale e nella norma facciale. (Atti. d. Soc. Rom. di Antrop., 1900, VII, fasc. 2.) Discusses height of squama of temporal bone as race-characteristic (results not very satisfactory), fontanelle bones and suture spaces and the *norma lateralis*, pretemporal bone, nasal skeleton, bipartite zygomatic bone, etc.

—— Sopravvivenze morfologiche in crani di aleniati. (Arch. d. Psich., Sci. Pen., ed Antrop. crim., Torino, 1901, XXII, fasc. 1.) Describes the mandible of an idiot, whose excessive volume causes it to approach that of prehistoric man; also notes the occurrence of the *torus occipitale* in the skull of a lunatic.

Gusinde (K.) Ueber Totenbretter. (Mitteil. d. Schles. Ges. f. Volkskunde, Breslau, 1900, 27–40.) An interesting account of "death-boards" in Central Europe (many inscriptions are cited), with numerous references to the literature of the subject. The superstitions are also noted.

Hartland (E. S.) Totemism and some recent discoveries. (Folk-Lore, London, 1900, XI, 52–80.) Address of President of Folk-Lore Society. Discusses the recent researches and publications of Dr Franz Boas in America and Messrs Spencer and Gillen in Australia, which, the author believes, have dealt "smashing blows" at the Maclennan-Frazer-Smith-Jevons theory of totemism, so that "there is hardly one stone of the fabric left upon another."

Henderson (C. R.) Prison laboratories. (Amer. Journ. Sociol., Chicago, 1900, VI, 316–323.) General statement of case for the institution of anthropometric and psycho-physical laboratories in prisons, with report of a committee of the National Prison Association.

—— The scope of social technology. (Ibid., 465–486.) Social technology deals with the problem of means in sociology. General outline and discussion.

Keller (A. G.) Sociology and the epic. (Ibid., 267–271.) A general statement of "the value of these poetical documents of the past as affording well-nigh indispensable material for the student of the history of civilization." Appeals for monographs on the social data of the great epics.

Klaatsch (H.) Der kurze Kopf des Musculus biceps femoris und seine morphologische Bedeutung. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 145–150.) The author looks upon the form of this muscle as primitive, a rudimentary formation belonging to the ancestor of the mammals, now occurring only sporadically.

Lasch (R.) Weitere Beiträge zur Geophagie. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 181–183.) Addenda to the article published in 1898.

Lasch — *Continued.*
Treats of earth as food, geophagy of pregnant women, earth-eating as a religious rite, pathological geophagy. It is worth noting that while the ancient Mexicans forbade the eating of earth by pregnant women, in Java and other parts of the East Indies it is in high favor.

Lee (*Miss* A.), and **Pearson** (K.) A first study of the correlation of the human skull. (Proc. Roy. Soc., London, 1901, LXVII, 333–337.) Abstract of the results of the examination of the skull capacity of some 60 men and 30 women, whose relative intellectual ability can be more or less roughly appreciated. The conclusion arrived at is that there is no marked degree of correlation between skull capacity and intellectual ability.

Lefébure (E.) Mirages visuels et auditifs. (Mélusine, Paris, 1900, X, 25–39, 49–56.) A detailed account, with many bibliographical references, of ancient and modern folk-belief about mirages (water and land), phantasmagoria, strange noises, echoes, singing sands, etc.

—— L'Arc-en-ciel. (Ibid., 97–111, 121–125.) A very interesting study, well provided with citations, of the rainbow among the poets (classical and French in particular). The form, color, composition are considered.

Le Sueur (W. D.) Notes on the study of language. (Trans. Ottawa Lit. and Scientif. Soc., 1899–1900, 93–118.) Treats of some of the most important facts about the origin, growth, and acquisition of language, its nature and possibilities for the expression of thought.

Leuba (J. H.) Introduction to a psychological study of religion. (Monist, Chicago, 1901, XI, 194–225.) Largely concerned with the discussion of definitions of religion.

Lombroso (Gina). I vantaggi della degenerazione. (Riv. di Sci. biol., Torino, 1900, II, 848–874.) Treats of degeneration in evolution, physical resistance of degenerate man, useful pathological phenomena, weakness of apparent strength, longevity of degenerate individuals and races, influence of civilization on longevity and degeneration, etc. A suggestive exposition of the thesis that "not all the anomalies stigmatized as degenerate are as disadvantageous to the species and to the individual as is commonly thought."

Marett (R. R.) Pre-animistic religion. (Folk-Lore, London, 1900, XI, 162–182.) Aims to set forth certain very primitive phases of religion, the religious phenomena "before *animism*." The author thinks *awe* the best term wherewith to denote "the fundamental religious feeling." Awe finds vent in *animatism*, then animism. Pages 318–321 contain remarks on M. Marett's paper by Andrew Lang and reply by the author.

Marro (A.) Puberal hygiene in relation to pedagogy and sociology. (Amer. Journ. Sociol., Chicago, 1900, VI, 224–237.) General discussion of the proper treatment of the boy and girl during the development of puberty. Advises repression of excitement, extravagances, etc.; counsels the use of "cool applications."

Murray (G.) National ideals, conscious and unconscious. (Internat. Journ. Ethics, Phila., 1900–1901, XI, 1–22.) Argues that "the unconscious or concealed ideals are the real forces that govern mankind."

von Negelein (J.) Die Reise der Seele ins Jenseits. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 16–28.) First part (the departure of the soul) of a general discussion of beliefs and practices of all peoples concerned with the journey of the soul in the other world. The author endeavors to be entirely unprejudiced in his treatment of the subject.

Netolitzky (F.) Ueber die Anwendung des Mikroskopes in der Urgeschichtsforschung. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1901, XXXI, 1–2.) Points out the importance of microscopical examination of the remains of textile materials, plants (used for food and other purposes), the earth in graves, mounds, etc., the exuviæ of animals and of human beings, the remains attaching to pottery and fragments of kitchen-utensils, weapons, and the like for ascertaining facts relative to the food-habits, plant-use, etc., of primitive man.

Penka (K.) Die Ethnologisch-ethnographische Bedeutung der megalithischen Grabbauten. (Mitth. d. Anthrop.

Penka — *Continued.*
Ges. in Wien, 1900, XXX, N. F. XX, 27–43.) A general discussion of the distribution and racial significance of megalithic grave-monuments (dolmens, etc.). The author notes the growth of the opinion that these relics of past ages have a common origin although widespread over the Eurafrica-Indic region. The article is well provided with references to the literature of the subject, and the views of Montelius, Meitzen, and Sophus Müller are gone into in detail. Penka sees in the small stone-chambers imitations of the dwellings of the living. The dolmens of the Mediterranean region are to be attributed to the blonde, *i. e.*, the Aryan race.

Polívka (G.) Tom Tit Tot. Ein Beitrag zur vergleichenden Märchenkunde. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 254–272, 325, 382–396, 438–439.) A detailed discussion of the origin and development, relationships, etc., of the tale after which Clodd's recent book is named. A valuable addition to the latter (which is more concerned with the content of the tale).

Read (C. H.) Presidential Address. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 6–21.) A review of the contributions to anthropological science by the members of the Institute during 1899, with more details in the case of those lately deceased.

Regnault (Félix) Le costume, son origine et ses transformations. (Rev. Scientif., Paris, 1901, 4e sér., XV, 103–112.) This article on the evolution of dress discusses briefly the rôles of utility, ornament, esthetics, trophy, relicism, modesty, etc., in the origin of dress. The influences of climate, active life, imitation, exaggeration, misoneism, age, social status, profession, urban and rural life, sex, are noted, and the conclusion contains some good advice on "the science of dress." The author expresses the safe opinion that "the origin of dress is complex."

Reinach (S.) Quelques observations sur le tabou. (Anthropologie, Paris, 1900, XI, 401–407.) A general discussion of the origin and meaning of taboo, and an attempt to define more exactly its signification. For the author a taboo is "une interdiction non motivée," unaccompanied by the threat of intervention of a legislator, and having the object of shielding men from unknown danger, and from the peril of death in particular. The roots of the taboo reach back into the animal world below man.

Russell (F.) Anthropology at Baltimore. (Science, N. Y., 1901, N. S. XIII, 139–142.) Brief account of papers read before Section H., A. A. A. S., at Baltimore, Md., Dec. 27–28, 1900.

de Saussure (L.) Le point de vue scientifique en sociologie. (Rev. Scientif., Paris, 1901, 4e sér., XV, 34–44.) The "scientific point of view" is the spirit of research into the relations of phenomena which is not biased by any utilitarian or sentimental considerations. This essay is the introduction to a "science of the relations of civilization to barbarism," which is to be embodied in a series of works edited by the author.

Schmid-Monnard (*Dr*) Ueber den Werth von Körpermaassen zur Beurtheilung des Körperzustandes von Kindern. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 130–133.) Discusses, with two tables and three sets of curves, the value of bodily measurements as indications of bodily conditions in children. Notes the existence of numerous deviations from the norms without any trace of disease or sickness. As the result of the investigation of 1021 boys and 1071 girls (from birth up to 14 years of age) belonging to Halle, the author concludes that there exists between stature and weight a fixed relation independent of age; hence when such relation is noted small size is nothing pathological.

Sergi (G.) Le forme del cranio umano nello sviluppo fetale in relazione alle forme adulte. (Riv. di Sci. Biol., Torino, 1900, II, 831–847.) The greater part of this second part of Prof. Sergi's study of the developmental relations of the fetal to the adult forms of the human skull is devoted to a descriptive and systematic catalogue of 88 fetal skulls (chiefly at term), preserved in the Museum of Comparative Anatomy (Jardin des Plantes) and the Broca Anthropological Museum (School of Medicine) at Paris. The measurements of length and breadth, together with the cephalic index are given, and there are eight figures in the text. The conclusions of the previous paper, with one or two exceptions, are confirmed.

Super (C. F.) Civilization and the ethical standard. (Amer. Antiq., Chicago, 1900, XXII, 358–366.) An argument for the "inherently ethical" nature of man in spite of his lapses, mistakes, and flippant treatment at times of the true, the good, and the beautiful.

Stefané-Pol (M.) La réglementation scientifique du mariage. (Rev. Scientif., Paris, 1901, 4e sér., XV, 34–44.) A reply to the arguments set forth in a previous number by M. Cazalis, whose book, La Science et le Mariage, has just been published. To encourage marriages, not to put obstacles in their way, is the better remedy; to prevent the marriage of the unfit may not accomplish as much as to secure the marriage of the fit, and improve the environments of all.

Thomas (N. W.) Animal superstitions and totemism. (Folk-Lore, London, 1900, XI, 227–267.) This valuable paper, provided with numerous bibliographical references, treats in considerable detail of the animal superstitions connected with totemism, which, the author says, "has been found as a living cult in only two considerable areas of the world's surface—North America and Australia." The superstitions in question are discussed under the following heads: Totemic or quasi-totemic; animals used in augury and sacrifice; annual ceremonies (sacrifice, communion). The author believes that the facts he has collected "conclusively prove the existence of an animal cult in Europe," and that the great mass of animal superstitions "originated in a system of totemism differing in no essential respect from that which we find among the non-European races."

EUROPE

d'Araujo (J.) Proverbios venezianos com equivalencia portugueza. (A Tradição, Serpa, 1901, III, 12–15.) A list of 92 Venetian proverbs and their equivalents in Portuguese.

d'Azevedo (P. A.) As Boas-Festas. (Ibid., 42–44, 75–76, 91–93.) An historical account of the Christmas and Easter festivals, which alone enjoy the epithet "good festivals."

Bacher (J.) Von dem deutschen Grenzposten Lusern im wälschen Südtirol. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 151–162, 306–319, 407–417; 1901, XI, 28–37.) Three sections of an interesting study of Luserna, a mountain community of German stock in the Italian Tirol. A brief historical sketch takes up the first part, the three others consisting of tales in the Luserna dialect, the original phonetic text and German translation being given in parallel columns, with explanatory notes on difficult or unusual words. So far 20 tales are recorded in these pages.

Balfour (H.) Guilloche pattern on an Etruscan potsherd. (Man, London, 1901, 8.) The potsherd here figured and described illustrates a genesis of the guilloche by "a more or less unconscious process, beginning with concentric circles in series."

Balladoro (A.) Cinquanta indovinelli Veronesi. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 34–39.) Of these 50 Veronese riddles 10 are in prose, 8 in three-line and 32 in four-line verses.

—— Impronte maravigliose in Italia. (Ibid., 126–129, 186–189, 443–449.) Continuation (Nos. XCIV–CXVII) from previous articles on "magic imprints." Imprints of hands, feet, etc., on pavements, rocks, marks of injuries on statues, persons changed into stone, etc., are discussed; several of the items relate to the Devil.

Bancalari (G.) Forschungen und Studien über das Haus. VI. Volksmässige Benennungen der Geräthe. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 1–23.) This article discusses the popular names in Austria and Germany of lamps and lights, stoves and heating apparatus, kitchen apparatus and utensils, furniture, vessels for fluids and solids, baskets, barn, stable and kindred implements, agricultural implements, etc., and contains many valuable items of culture-history. The names for lighting and heating apparatus are particularly interesting. It is worth noting that the "fire-dog" (*Feuerhund* in Berchtesgaden) is known as "fire-horse" (*Feuerross*) in Steiermark and Upper and Lower Austria.

Barella (D.) Cantilene infantili della Sardegna centrale. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 307–321, 433–442.) Texts, with occasional notes, of 87 *cantilenæ*, of which

Barella — *Continued.*
15 relate to natural phenomena, 19 to animals, birds, insects, etc., 10 to playthings, 21 to raillery at bad actions, names, etc., 13 to games. These children's songs were collected in Nuoro and the surrounding villages, though a good many of them belong to the whole island.

Blümml (E. K.) und **Rott** (A. J.) Die Verwendung der Pflanzen durch die Kinder in Deutschböhmen und Niederösterreich. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 49–64.) In this interesting and valuable paper the authors enumerate (the common and botanical names are given), with occasionally detailed explanatory notes, 106 species of plants used for various purposes (food, games, childish arts and industries) by children in German Bohemia and Lower Austria.

Bogišić (V.) Publication et enquête de proverbes en Russie. (Mélusine, Paris, 1900, X, 129–141.) Discusses recent studies of Russian proverbs by Simoni. The author's collection of proverb-literature numbers 1,500 books and pamphlets and MSS. containing 90,000 proverbs (Slavonic 62,000).

Bolte (J.) Volkstümliche Zahlzeichen und Jahreszahlrätsel. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 186–194.) Deals with signs used by the folk (builders, masons, threshers, etc.) for the numbers 5, 10, 11, 19, etc., and with "year-riddles," of which latter many examples are given; CLX, *e. g.* = a sausage, a scythe, and a cross. Some interesting comparisons might be made here between these folk-phenomena and the "number forms" of childhood.

Bosanquet (B.) The English people: notes on national characteristics. (Internat. Monthly, Burlington, Vt., 1901, III, 71–116.) A popular sketch of race-psychology well and interestingly written by a philosopher. Insularity, inarticulateness, particularity, individuality, etc., are discussed in their various bearings upon English thought and action.

Breuil (*L'Abbé*) L'âge du bronze dans le bassin de Paris. I. Les épées et dagues du bassin de la Somme. (Anthropologie, Paris, 1900, XI, 503–534.) The first part (with eight figures, illustrating 119 specimens, in the text) of thorough-going study of the age of bronze in the Paris basin. This article deals with swords and daggers, their parts and appurtenances, wholly or in part of bronze. Comparisons are made with similar objects in England and esewhere.

Bünker (J. R.) Eine heanzische Bauernhochzeit. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 288–306, 365–382.) A valuable, detailed description of the wedding-feast (the greatest and most brilliant of all their festivals) among the *Heanzen*, a German people dwelling in the western parts of Eisenburg and Odenburg in western Hungary. No item of the event seems missed.

—— Eiserne Opferthiere. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 185–186.) Brief description, with 6 figures in the text, of animal figures of iron offered up, as votive gifts, at churches on certain saints' days within the last 30 years. Such offerings were once very common at Kogel, Trebesing, etc.

Buss (E.) Die religiösen und weltlichen Festgebräuche im Kanton Glarus. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 245–308.) An interesting, more or less detailed account of annual festivals, occasional celebrations, family ceremonials, etc. in Glarus, from saints' days to festivals of youth, the whole round of folk-life being covered.

Calliano (G.) Prähistorische und römische Funde in und um Baden. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 111–116.) General historical and critical sketch of archeological discoveries in and around Baden. The author holds that the remains of sculptures and marble-work especially dispose of the theory that Baden was only a little military station in Roman times.

Carmi (Maria) Il dramma della Passione ad Oberammergau. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 378–400.) A detailed account, with criticisms of the Passion Play at Oberammergau in 1900.

Casal (E.) La festa dei fior. (Ibid., 238–255.) Describes, with historical notes and numerous bibliographical references, the "festival of flowers" at Caprile, and discusses its significance.

Chadwick (H. M.) The ancient Teutonic priesthood. (Folk-Lore, London, 1900, XI, 268–300.) A comparative study of the priesthood in ancient Germany and Scandinavia. The author holds that the priests of the ancient Germans had little in common with the *vates* of the Gauls, and that priestly duties were discharged by the temporal chief, while in the Scandinavian region the existence of a priestly class has not been clearly demonstrated. M. Chadwick argues for the origin of the German priesthood from a previously existing monarchy.

—— The oak and the thunder-god. (Jour. Anthrop. Inst., London, 1900, XXX, N. S. III, 22–44.) Treats of the thunder-god among the Scandinavians, continental Germans, Celts, ancient Prussians, Slavs, etc.; of the "tree-sanctuary" among these peoples, of the association between the thunder-god and the oak, and of the theories relating thereto. The author concludes that "the cult of the thunder-god was in early times common to most of the Indo-Germanic races or peoples of Europe,"—the distribution of the tree-sanctuary is less certainly made out. Mr Chadwick holds that "the thunder-god was *the* god of the primitive European community" and that he was supposed to inhabit the oak "because it had formerly been the dwelling-place of his worshipper." The oak acquired its sanctity from the fact that priests dwelt under it and not *vice versa*.

Chamberlain (Isabel C.) The devil's grandmother. (Journ. Am. Folk-Lore, Boston, 1900, XIII, 278–280.) Brief list of folk-sayings of Teutonic peoples concerning the "devil's dam."

Coelho (T.) O Senhor Sete. (A Tradição, Serpa, 1900, II, 39–42, 69–71, 86–88, 97–102, 118–120, 135–138, 154–157, 162–168, 185–186; 1901, III, 8–10, 17–22.) "Mr Seven" is an interesting and valuable collection of folk-lore (poetry, proverbs, superstitions, etc.) relating to the number seven.

Ellis (H.) A study of British genius. (Pop. Sci. Mo., N. Y., 1901, LVIII, 372–380, 540–547, 595–603.) An anthropological-psychological study of the character, parentage, racial and social characteristics, etc., of British genius. The bases of the study are 859 men and 43 women of high intellectual ability as recorded in the Dictionary of National Biography, selected from the 30,000 persons with whom the 63 volumes of this work deal. Mr Ellis notes the presence of two important factors, "a spontaneous rhythmical rise and fall in the production of genius," and "the stimulating influence of great historical events, calling out latent intellectual energy." He also suggests that we may have "a fresh outburst of intellectual ability at the beginning of the twentieth century." As compared with England, Wales and Ireland produce not enough and Scotland more than her share of men of genius. Norfolk, in England, is a noteworthy genius-centre. The proletariat have produced few men of genius in contrast with the "gentlemen,"—education seems not to have changed this. Geniuses tend to be the oldest or youngest sons of large families (father 30–34 years, mother 26–40 old). Mr Ellis emphasizes the fact that men of genius in the conditions of their birth parallel the other classes of mankind who are mentally abnormal.

Förtsch (*Dr*) Ueber die vor- und frühgeschichtlichen Verhältnisse der Provinz Sachsen. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 77–80.) The author traces briefly the anthropological history of Saxony from the stone age down to the fifteenth century of our era. Very few traces of paleolithic man have been discovered hitherto in this region; the high development of stone-age ceramics is noteworthy; and the transition from stone to bronze seems to have been rather gradual. The Hallstatt and La Tène cultures appear to have existed side by side for a long time. The Slavs, Dr Förtsch thinks, brought little if any culture into Saxony.

Forzano (G.) La vita nel villagio di S. Gorgio. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 518–520.) Brief account of folk-life in a village of the Province of Messina.

Freund (*Dr*) Ein Faltstuhl aus der älteren Bronzezeit. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 144–145.) Describes a "folding chair" of the older bronze period, found in 1869 at Bechelsdorf (Ratzeburg), and notes the fact of the frequency of such chairs over a wide area during this age.

Gaster (M.) Two thousand years of a charm against the child-stealing witch. (Folk-Lore, London, 1900, XI, 129–162.) Discusses the wanderings of "one of the longest and most complete [the text is given] in the whole range of Roumanian charms," in oral and in written literature. The charm is held to be of Oriental origin, Babylonian, perhaps, and has changed comparatively little during the centuries.

Giuffrida-Ruggeri (V.) Le origini Italiche. (Riv. di Sci. Biol., Torino, 1900, II, 926–932.) A critical review of recent anthropological literature concerning the earliest Italian peoples and their culture. The author does not favor the term "Ibero-Ligurian," not admitting the identity of the two races. He also disapproves the attempt to make funeral-rites absolute evidences of race-diversities.

Götze (A.) Die Eintheilung der neolithischen Periode in Mitteleuropa. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 133–137.) An attempt by means of the grouping of pottery specimens (illustrated in the text) to fix a division of the neolithic period in central Europe. The author recognizes two sub-periods, the first of which is represented by "Schur-" and "Zonenkeramik."

Gray (J.) and **Tocher** (J. F.) The physical characteristics of adults and school-children in East Aberdeenshire. (Jour. Anthrop. Inst., London, 1900, XXX, N. S. III, 104–124.) This paper, supplied with tables, maps of distribution, and cephalic charts, *résumés* the results of the investigation of shape of the nose and the hair and eyes of 14,561 children (boys 7717) and 3262 adults (women 551); also the measurements of stature, height sitting, maximum length and breadth of head of 402 adults of various classes and occupations. Among the facts brought out by these investigations are the existence of "a very much smaller percentage of the blond element than has been generally supposed"; an excess of brown hair over brown eyes; post-natal darkening of females; increase of brown hair among adults 15 to 16 % (Virchow's estimate for Germany is 15 %).

Hein (W.) Die Opfer-Bärmutter als Stachelkugel. (Ztschr. d. Ver. f. Volkskunde. Berlin, 1900, X, 420–426.) Describes (with three figures in text) the use of iron spike-balls as votive offerings of women suffering from womb troubles in parts of Austria, Switzerland, and Germany.

Heinemann (F.) Die Henker und Scharfrichter als Volks- und Viehärzte seit Ausgang des Mittelalters. (Schweiz. Archiv. f. Volkskunde, Zürich, 1900, IV, 1–16.) A discussion of the rôle of the hangman and executioner as physician and animal-doctor in post-medieval Germany and Switzerland. As late as the first quarter of the nineteenth century the popular assembly at Altdorf had to choose, for "Landesphysicus," between a regular physician and the executioner of Uri.

Henning (*Dr*) Bericht über die letzten Strassburger Ausgrabungen und über die neue archäologische Bewegung in Deutschland. (Corrbl. d. deutschen Ges. f. Anthrop., 1900, XXXI, 92–96.) Deals with the discoveries of remains of the Roman period (city walls especially) at Strassburg, the Argentorate of the oldest documents. Contains also an appeal for the archeological investigation and preservation of the oldest German remains.

Hertzberg (G.) Die Halloren in Halle a. S. (Ibid., 118–120.) Brief account of the *Hallori* (the name is first known in 1630), or salt-workers, whose history is bound up with that of the city of Halle from the most ancient times.

Höfer (P.) Ueber drei neue Hausurnen und über Hausurnentypen. (Ibid., 115–118.) The number of hut urns so far discovered in Germany is 25 (from Saxony 16, and from Anhalt 6). Dr Höfer describes three new specimens from Hoym and Wulferstedt.

Hoffmann-Krayer (E.) Das Berner "Matten-English." (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 39–44.) Specimens—text and vocabulary—of a student-jargon in Bern, with request for further information.

Hoernes (M.) Bronzen aus Wien und Umgebung im k. k. naturhistorischen Hofmuseum und die Bronzezeit Niederösterreichs im Allgemeinen. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 65–78.) A description (with four plates and two figures in the text) of bronze specimens from Vienna and the

Hoernes — *Continued.*
eastern half of Lower Austria in the Royal Museum of Natural History, followed by a brief general account of the bronze age in Lower Austria.

Janowski (A.) Rysunki z piasku pized chata. (Wisła, Warzawa, 1900, XIV, 314–318.) Describes briefly, with two plates (21 figures) sand-drawings made in front of the huts at Smardzewice.

Kahle (B.) Der Ort der Hochzeit auf Island zur Sagazeit. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 40–46.) From the data in the old Iceland sagas, the author argues that a solemn procession or conduction of the bride to her new home, where she was formally given over to her waiting husband, did not take place; the nature of the country accounts for the absence of this. The various places where weddings took place—house of either party, of parents, relatives, guardians, friends, etc.—are noted.

Köhl (*Dr*) Neue stein- und frühmetallzeitliche Gräberfunde bei Worms. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 137–142.) Describes, with five figures in the text, the investigation of a prehistoric burial ground near Worms, in which 25 graves were successively discovered. These Adlerberg graves contain remains from four periods (two stone and two metal), and represent largely the transition between the age of stone and that of metal. The skeletons are tall, with mesocephalic skulls, and little evidence of platycnemia. The corpses had the crouched (*hockend*) position.

Lewis (A. L.) The stone circles of Scotland. (Jour. Anthrop. Inst., London, 1900, XXX, N. S. III, 56–72.) A general description (with six figures) of the principal stone circles in Scotland and the Isles. The author notes that "stone circles are still much more plentiful in certain parts of Scotland than in the rest of Britain, but many that formerly existed have been destroyed, and for the most part without any satisfactory description of them having been preserved." In the Aberdeen district more than thirty circles (26 having the peculiar "altar stone") have been listed. Mr Lewis distinguishes three different types of stone circles in Scotland: Western Scottish (irregular ring), Inverness (ring about tumulus), Aberdeen (ring with "altar stone"). Sun and star circles, and possibly other classes, may also be distinguished.

Majewski (E.) Rodzina kruków w mouře projęciach i praktykach ludu polskiego. (Wisła, Warzawa, 1900, XIV, 28–41, 152–179.) A study of the crow (*corvus*) in folk-speech, legend, proverb, tale, and superstition in Poland. The various species of crows are taken up, lists of place-names derived from them, proverbial expression and divers items of folk-belief concerning them given. Poetical references and appearances in myths and legends are also noted in detail.

Makowski (W.) Dożywocie. (Ibid., 241–252.) Discusses with some detail the *dożywocie* or property relation between grown-up children and old parents.

Matiegka (H.) Bericht über die anthropologische Untersuchung der Gebeine Paul J. Šafařík's. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 179–181.) Brief account (with details of measurements) of the condition and characteristics of the skull of Šafařík, the distinguished Slavonic scholar, a Slovak by birth. The investigation took place in connection with the exhuming of his body in May, 1900. The skull is very regular and no anomaly could be detected. The content of the skull was 1738 cubic cm., or nearly 200 cm. above the average.

Meier (S.) Volkstümliches aus dem Frei- und Kelleramt. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 17–29, 167–173, 221–232, 321–328.) Folklore about birth, childhood, food and meals, clothing, household stuff, care of body, folk-medicine.

Meisner (*Dr*) Scherben mit Fingereindrücken. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 120–122.) Describes, with two figures in the text, a fragment of pottery from the pile-dwellings at Corcelettes (Lake Neuchatel), with impressions of fingertips, including nails. The condition and shape of the nails the author considers valuable anthropological data, according to the views of Kollmann, Minakow and others concerning the relation of nail-types to stature, size, etc.

Meyer (R. M.) Goethe und die deutsche Volkskunde. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 1–15.) Discusses from the evidence of his life and writings Goethe's interest in folk-life and folk-lore. The author concludes that Goethe's folk-interest was hardly more than a "Dreingucken."

Montelius (O.) On the earliest communications between Italy and Scandinavia. (Jour. Anthrop. Inst., 1900, XXX, N. S. III, 89–94.) From the consideration of bronze vessels, ornaments, swords, shields (figured in the three plates accompanying the paper), Dr Montelius concludes that "the Italian bronzes imported into Scandinavia were in use contemporaneously in Sweden and in Italy." The third millennium B.C. is none too early for the relations in question in their first developments. These articles traveled to Scandinavia by the amber trade route, and the transit could have been made in two months.

—— Ueber das erste Auftreten des Eisens. (Corrbl. der deutschen Ges. f. Anthrop., München, 1900, XXXI, 142–144.) From present evidence (no remains of iron go back further than the fifteenth century B.C.) iron seems to have been discovered about the middle of the second millennium B.C., probably in the Orient, whence its use reached Europe and the West.

Müllenhoff (K.) Zur Geschichte der Bienenzucht in Deutschland. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 16–26.) Interesting sketch of the history of apiculture in Germany. Beekeeping, charms, folk-lore, laws, etc., are treated.

Nicklin (J. A.) The Greek view of life. (Internat. Jour. of Ethics, Phila., 1900–1901, XI, 227–232.) Protests against the characterization of Greek genius as wholly sensuous,—it reconciled the intellect with the senses.

Pimentel (A.) Os proverbios e a medicina. (A Tradição, Serpa, 1900, II, 65–69, 120–124.) Discusses Portuguese proverbs and popular sayings in relation to medicine, and their hints of scientific truth.

Pineau (L.) Vieux chants populaires Scandinaves de l'âge barbare. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 289–306.) General discussion of the reflection of barbarous life in old Scandinavian songs, with frequent citations in illustration of the theme.

—— Paysans Scandinaves d'autrefois et paysans Français d'aujourd'hui. (Rev. d. Trad. Pop., Paris, 1900, XV, 497–502.) Cites instances of folk-lore to prove "the astonishing likeness" between the Scandinavian peasantry of old [as described in Saxo Grammaticus and Olavus Magnus] and the French peasantry of today.

Piroutet (M.) Contribution à l'étude du premier âge du fer dans les Départements du Jura et du Doubs. (Anthropologie, Paris, 1900, XI, 369–400.) This article, illustrated by 21 figures in the text, discusses in considerable detail the tumuli of the early iron age in the region of the Jura and Doubs and their contents. The author combats the idea formerly very prevalent that these tumuli represented battle-fields, the tombs of fallen Gaulish, Roman, Frankish, and Saracen warriors.

Pitré (G.) Delle feste patronali in Sicilia. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 3–17, 145–168.) A detailed and valuable study of patron saints and their festivals in various cities and towns of Sicily, customs, legends, etc., connected therewith. In the middle of the seventeenth century Palermo had 31 patron saints, and today in 150 Sicilian communes there are 50.

—— Contributo alla bibliografia dei "Contes des Fées" di Ch. Perrault, d'Aulnoy e Leprince de Beaumont in Italia. (Ibid., 256–259.) Titles, with notes, 26 editions of Italian books containing in whole or in part Perrault's "Fairy Tales."

—— Le tradizioni popolari nella *Divina Commedia*. (Ibid., 521–554.) Cites, with explanatory notes and references to literature, 43 passages from Dante's *Divine Comedy*, containing items of folk-lore of various sorts,—customs, games, beliefs, superstitions, legends, proverbs.

Radziukinas (J.) Dzuki. (Wisła, Warzawa, 1900, XIV, 42–54.) An ethnographical sketch of the "Dzukis," of the Government of Suwalki, in Poland.

Regàlia (E.) Sulla fauna della Grotta di Pertosa, Salerno, con un sunto della relativa pubblicazione paletnologica del Prof. G. Patroni. (Arch. p. l'Antrop. e la Etnol., Firenze, 1900, XXX, 25–54.) An account of the finds in the prehistoric grotto-station of Pertosa in the Province of Salerno. To the report on the fauna by Dr Regàlia is added a *résumé* of Prof. Patroni's investigation of the evidences of human habitation. This grotto is remarkable for possessing a pile-dwelling, proof of the efforts of man to contend against the water and the mud of the torrent coursing through it. The station dates at least from the first age of bronze. A similar grotto has recently been discovered in Caggiano, in the same province.

Rehme (——) und **Voght** (V.) Beiträge zur Geschichte des deutschen Volksschauspiels in Schlesien. (Mitteil. d. Schles. Ges. f. Volkskunde, Breslau, 1900, 77–93.) A general account from the archives of Breslau of the folk-drama in Silesia, which lasted till well into the first half of the nineteenth century.

Reinach (S.) Témoignages antiques sur l'écriture Mycénienne. (Anthropologie, Paris, 1900, XI, 497–502.) Discusses passages in Diodorus Siculus and Plutarch, which seem to indicate that the ancient Greeks were not altogether ignorant of the important Mycenian civilization with its graphic system.

Reinecke (P.) Brandgräber vom Beginne der Hallstattzeit aus dem östlichen Alpenländern und die Chronologie des Grabfeldes von Hallstatt. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 44–49.) During the early stages of the Hallstatt period the region of the eastern Alps, like the whole country from Italy to Scandinavia, affords evidence of the incineration of the dead. The author describes the contents of several grave-mounds of this era, and points out that about 1000 B.C., the finds in the Alps and northward to the North sea and Scandinavia give proof of very close relationship. The most modern graves of the Hallstatt cemetery date from the fourth century B.C.

—— Grabhügelfund von Joschewa in Serbien. (Ibid., 50–52.) From one of two mounds, the only ones in the neighborhood, were obtained a bronze sword and a clay vessel (of a type hitherto unknown in the Balkan region). These finds seem to indicate the extension of Hungarian bronze-work and pottery into parts of the Balkan peninsula during the third and fourth periods of the bronze age.

Rhŷs (J.) On certain wells in Ireland. (Man, London, 1901, 12–13.) Contains extracts from letter of Sir Henry Blake, on tabooed wells and on a sea-calming "knievogue" or little saint.

Ringholz (P. O.) Die Ausbreitung der Verehrung des hl. Meinrad. (Schweiz. Arch. f. Volkskunde, Zürich, 1900, IV, 85–130.) A historico-geographical sketch (with map) of the rise and extension of the worship of St Meinrad (d. 861 A.D.) in Switzerland and beyond its borders.

Salomone-Moreno (S.) Le storie popolari in poesia Siciliana messe a stampa dal secolo XV. ai di nostri. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 48–64, 327–364.) A detailed bibliography of folk-tales in Sicilian poetry printed from the fifteenth century down to the present time. Thirty-five titles are given, and pages 328–364 are occupied by an alphabetical list of Sicilian folk-poets (numbering more than 200) with brief notices.

Seiler (A.) Kirsche und Kirschbaum im Spiegel schweizer-deutscher Sprache und Sitte. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 199–213.) Interesting information about German-Swiss names for cherries and cherry-trees, place-names derived from them, cultivation of cherry-trees, property in them, folk-sayings about them.

Simon (T.) Recherches anthropométriques sur 223 garçons anormaux âgés de 8 à 23 ans. (Année Psychol., Paris, 1899 [1900], VI, 191–247.) Details of study of idiotic and feeble-minded children at Vaucluse (Seine). Author concludes that a correlation does exist between physical and intellectual development.

Smólski (G.) Zwycieczki na Mazowsze Pruskie. (Wisła, Warzawa, 1900, XIV, 113–130, 284–298.) Describes a visit in 1899 in Prussian Masovia (the country of the Mazurs), with ethnographic and historical notes. It is from this region that the *mazurka* has its name.

Thomas (N. W.) O mercado de Grillos. (A Tradição, Serpa, 1900, II, 129–130.) Brief discussion of the sale of crickets in various parts of Europe and its significance in folk-lore.

Titelbach (V.) The sacred fire among the Slavic races of the Balkan. (Open Court, Chicago, 1901, XV, 143–149.) This article, with 6 illustrations, treats of the kindling of the "living fire," and is translated from Internat. Arch. f. Ethnogr., XIII, 1–2.

Trotter (A.) Di alcune produzioni patologiche delle piante nella credenza popolare. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 207–214.) Items of folk-belief from various parts of Europe (Italy chiefly) concerning "galls" on oaks, beeches,—"oak apples," etc.,—and their use in folk-medicine.

Tuchmann (J.) La fascination. (Mélusine, Paris, 1900, X, 8–14, 40–46, 68–70, 115–117, 125–127.) Discusses with numerous bibliographical references the prophylaxis and jurisprudence of fascination in ancient and modern times among various peoples.

Udziela (S.) Swiat nadzmysłowy ludu krakowskiego. (Wisła, Warzawa, 1900, XIV, 1–2, 132–144, 253–272.) Items 272–330 of a detailed account of folk-beliefs in and about Krakow concerning the supernatural world.

Vaschide (N.) and **Piéron** (H.) Prophetic dreams in Greek and Roman Antiquity. (Monist, Chicago, 1901, XI, 161–194.) General discussion with literary references.

Virchow (R.) Ueber das Auftreten der Slaven in Deutschland. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 109–115.) Interesting discussion of race-contact in North Germany. The author warns against looking upon all peoples termed *Wends* as Slavs, confesses his inability to state absolutely what is a Germanic and what is a Slavonic skull, and expresses the opinion that, after the emigration of the old stocks in northern Germany, the land was "empty," so the new immigration was no conquest at all.

—— Der Fund einer mit geschlagenen Feuersteinen gefüllten Meermuschel bei Braunschweig. (Ibid., 129–130.) Discusses the finding of a *Tritonium* (the species belongs to the Red sea and Indian ocean) on the hill near Brunswick, where digging for flints had been carried on.

Vital (A.) Der Cudesch da Babania. (Schweiz. Archiv f. Volkskunde, Zürich, 1900, IV, 174–176.) Treats of the "wheel of fortune" consultation on Jan. 6. (Epiphany) in the Engadin.

Wasilewski (L.) Zdziejów zachodniej granicy etnograficznej stowiánskiej. (Wista, Warzawa, 1900, XIV, 13–27.) A statistical study of the Germanization of the Polish borders.

Weinhold (K.) Ueber die Bedeutung des Haselstrauchs im altgermanischen Kultus und Zauberwesen. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1901, XI, 1–16.) According to the author the evidence *résuméd* here indicates that in ancient Teutonic cultus and magic the hazel was a sacred implement, a holy symbol. The hazel-rod was the weapon of the celestial deity and possessed a sacred power which beneficently radiated in all directions among men. The hazel appears as altar-sacrifice, lightning-protector, wind-ward, charm-breaker, shepherd's staff, doctor's rod, wishing-stick, water-finder, magic-staff, rain-charm.

—— Ein hochdeutscher Augensegen. (Ibid., 79–82.) Text from a Cambridge MS. of the twelfth century, of an old High German "eye-charm," with explanatory notes.

Weisbach (A.) Die Deutschen Kärntens. (Mitth. d. Anthrop. Ges. in Wien, 1900, XXX, N. F. XX, 78–96.) Discusses in considerable detail, with maps and tables, the results of the anthropometric investigation (stature, color of hair and eyes, color of skin, head-measurements) of 736 soldiers (individuals with non-German names or "pathological" head-forms excluded) between 21 and 25 years of age. The results are compared with those in the surrounding provinces of Austria, based on the author's investigation of 10,834 subjects altogether. The Carinthian Germans are taller, less brown-haired, more blue-eyed, less white-skinned, less mixed as to blond and brunette types, less brachycephalic and more dolichocephalic than those of the adjoining regions.

Wiedersheim (R.) Organi rudimentali dell'uomo. (Riv. d. Sci. Biol., II, 801–830.) General discussion with numerous illustrations in text.

Wilson (T.) Criminology. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 294–300.) A general statement, illustrated with four plates, of the claims of criminology, with the author's reasons for rejecting Lombroso's theory.

Winslow (W. C.) The palace of Minos in Crete. (Amer. Antiq., Chicago, 1901, XXIII, 54–57.) Brief discussion of the recent finds at Cnossus made by Mr A. J. Evans, with their bearings upon Egypto-Ægean relations. The author's conclusion is that "Cretan genius borrowed from Egypt, but beautified and added to it all."

—— The tombs at Abydos. (Ibid., 141–144.) General account, after Petrie, of recent explorations.

AFRICA

Arnaud-Régis (P.) Coutumes et superstitions de la Casamance. (Rev. d. Trad. Pop., Paris, 1900, XV, 325–330.) Items about sorcery, funerals, and marriage from the region of Casamance river in West Africa, peopled by the Mandingos, Diolas, etc.

Balfour (H.) Native smoking-pipes from Natal. (Man, London, 1901, 11–12.) Describes and figures four pipes, in one of which a penny stoneware ink-bottle has been utilized as a bowl.

Delafosse (M.) Sur des traces probables de civilisation Egyptienne et d'hommes de race blanche à la Côte d'Ivoire. (Anthropologie, Paris, 1900, XI, 431–451, 543–568.) These two sections of an extended study, illustratrated with 18 figures in the text, deal with the evidence (from houses, clothing, furniture, pottery, tools, gold and metal work, sculpture, bas-reliefs, caricature, music and dance, property and succession laws, condition of women, insignia of power, cosmology, astronomy, medicine, religion, funeral rites, cult of the dead, tombs, etc.) that the Baoulé of the Ivory Coast have been touched in times past by the civilization of ancient Egypt. Some of the alleged identities are accidental, others merely superficial, but in the case of a few of the sculptures, masks, etc., and perhaps in some matters of astronomy and religion, Egyptian influence may ultimately be proved.

Girard (H.) Les Dinkas Nilotiques. (Ibid., 409–429.) After a brief general account of the natives and their country, details (with tables) are given of the various bodily and cranial measurements of three male Dinkas of the Nile,—the Dinkas are a pastoral negro people of tall stature, markedly dolichocephalic, and of average intelligence.

Griffith (F. D.) The system of writing in ancient Egypt. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 153–159.) A general exposition of the chief features of Egyptian hieroglyphic writing. The author points out how the Egyptians never took full advantage of their great discovery of the alphabetic sign, conservatism, superstition, and the artist-scribes' appreciation of the decorative value of hieroglyphic writing combining to retard progress. He also argues against the alleged acrophonic origin of the Egyptian alphabet, and notes that "in the great decline of taste under Ptolemaic and Roman rule the inscriptions are crowded with fantastic inventions of new values and new signs." The hieratic or cursive writing can be traced back to the first dynasty. There is as yet "no clear evidence that Egyptian writing was either borrowed from or borrowed by any country outside the Nile valley."

Kingston (H. D. R.) Notes on some caves in the T'Zitzikama or Outeniqua district, near Knysna, South Africa, and the objects found therein. (Ibid., 45–49.) These caves contain evidence (shells, implements of bone and stone) of the sojourn of the so-called "strand loopers," who are believed to have preceded the Hottentots in this region. The paper is accompanied by a plate showing 13 specimens of flaked quartzite, worked pebbles, etc.

Koettlitz (R.) Notes on the Galla of Walega and the Bertat. (Ibid., 50–55.) Dr Koettlitz was a member of the Blundell expedition of 1898, which traversed the Somàl-Galla country. Dress, ornaments, weapons, granaries are described. The author also gives (in feet and inches) the mean of a number of anthropological measurements of Abyssinians, Galla, and Bertat.

Le Roy (*Mgr*) Usages des négrilles d'Afrique et des négritos d'Asie. (Arch. p. l. Stud. d. Trad. Pop., Palermo, 1900, XIX, 117–118.) Items relating to birth, circumcision, adolescence, marriage, death, funerals, etc.

MacIver (D.) Recent anthropological work in Egypt. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 95–103.) This paper, which is illustrated with six figures in the text and two plates of diagrams, is an interesting attempt by means of the seriation and charting of the results of the measurements of over 1,400 skulls of all periods of ancient Egyptian history (from 5000 B.C. to 500 A.D.), to demonstrate the fluctuations of certain physical characteristics (length and breadth of skull, cephalic, nasal, and alveolar indices) during a long period of time. The course of events, according to Mr MacIver, has been as follows: First people, long-headed, broad-nosed Libyans; some time before the fourth dynasty supplanting of Libyans by Puntites with broader heads and slenderer noses; sixth to twelfth dynasties period of fusion, or mixture of the two stocks; between twelfth and eighteenth dynasties invasion by a narrow-headed, fine-nosed people.

Mochi (A.) Gli oggetti etnografici delle popolazioni etiopiche posseduti dal Museo Nazionale d'Antropologia in Firenze. (Arch. p. l'Anthrop. e la Etnol., Firenze, 1900, XXX, 87–172.) A well-compiled descriptive list (with ethnographic introduction, index, and bibliography of 65 titles) of 88 ethnographic specimens and groups of objects from the native races of northeastern Africa (Erythreans and Abyssinians 64; Danakil, 10; Somàl, 12; Galla, 2). The objects treated of are weapons, implements, personal ornaments, amulets, pictures, etc. Among the facts brought out by the consideration of this collection is "the modifying influence exerted by Semitic invasions and the evidence of ancient contact with Europe."

Packard (A. S.) Prehistoric tombs of eastern Algeria. (Pop. Sci. Mo., N. Y., 1901, LVIII, 397–404.) Describes a visit to the dolmen-field and necropolis of Rocknia and *résumés* theories as to their origin.

Pittard (E.) Note sur deux crânes de Congolais peu connus. (Anthropologie, Paris, 1900, XI, 535–542.) Describes with four figures in the text and measurements in detail, a male skull of the Bayaka and a female skull of the Bassundi, both tribes of the central Congo.

Pope-Hennessy (H.) Notes on the Jukos and other tribes of the middle Benue. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 24–31.) These notes, made during a journey in 1898, deal with the Tangale, Wuruku, Ligori, and Juko tribes of the middle Benue, a tributary of the Niger. Mode of subsistence, cannibalism, hunting and fighting, clothing, marriage, religion, and "medicine" are among the topics considered. Among the Jukos the custom of king-killing prevails.

Sayce (A. H.) Cairene folklore. (Folk-Lore, London, XI, 354–395.) Some fifteen stories (of nearly all the Cairene text is given) and a large number of items (pp. 379–395), of folk-lore items of every sort. Dr Sayce notes "that comparatively few of the stories are ætiological." Interesting are some traces of the "Arabian Nights," all knowledge of which "is ignored by orthodox Mohammedanism." We also learn that "the folk-lore of Cairo, though largely of Arab origin, has little about it that is distinctly Arab." Much of it is pre-Mohammedan, ancient Egyptian.

di Ujfalvy (C.) Tracce di steatopigia nei Greci della Cirenaica. (Arch. p. l'Anthrop. e la Etnol., Firenze, 1900, XXX, 19–24.) From the condition of the human figures on two cups of Cyrenian origin (dating from the fifth century B.C.), preserved in the National Museum at Paris, the author deduces the existence of steatopygy among the Cyrenian Greeks. This peculiarity of the Cyrenian type the artist has represented in his figures.

ASIA

Basset (R.) Contes et légendes Arabes. (Rev. de Trad. Pop., Paris, 1900, XV, 22–43, 105–114, 143–151, 190–199, 281–288, 353–364, 459–470, 526–542, 606–612, 665–675.) Continued from previous volume. French texts of 223 tales and legends long and short of all kinds, with references to literature.

Basset (R.) Contes et légendes de l'Extrême-Orient. (Ibid., 45–48, 319–323, 403–414, 593–596.) Continued from previous volume. French texts of 25 brief tales and legends from various parts of southeastern Asia and the islands of the Pacific.

Crooke (W.) The legends of Krishna. (Folk-Lore, London, 1900, XI, 1–38.) A general account of the popular legends and myths of the Krishna cult, the neo-Brâhmanic faith of 207,000,000 people in India more or less. The last half of the paper treats: of the origin and real significance of the name *Krishna*, "black, dark." The author thinks the Krishna-legends have absorbed very many folk-beliefs, and that the Dravidian element in them is larger than is generally believed.

Dumontier (G.) Traditions populaires sino-annamites. (Rev. d. Trad. Pop., Paris, 1900, XV, 51–54.) Folk-lore about clouds and water.

Ellon (F.) Verzeichniss der japanisch-buddhistischen Holzbildwerke. (Ethnol. Notizbl., Berlin, 1901, II, 41–57.) List, with explanatory notes, of a collection of 141 specimens of Japanese Buddhistic wood carvings presented to the Royal Ethnological Museum in Berlin by Hr. Ellon. The catalogue is followed (pp. 58–59) by some "Notes" by F. W. R. Müller.

Gale (J. S.) Korean beliefs. (Folk-Lore, London, 1900, XI, 325–332.) Items of folk-lore relating to Hananim (the Korean Great Spirit), mountains and mountain-spirits, islands, lake-spirits and dragons, rivers and streams. The Korean texts of many of the items are given.

Jiriczek (O. L.) Hamlet in Iran. (Ztschr. d. Ver. f. Volkskunde, Berlin, 1900, X, 353–364.) Discusses the resemblances between "Hamlet" and the story of Kei Chosro in the Shah-Nameh, and points of *rapprochement* with other legends.

Krafft (H.) Contes et apologues recueillis au Turkestan russe. (Rev. d. Trad. Pop., Paris, 1900, XV, 644–656.) Twelve fables and three tales (with references to literature) from Mussulmans of Russian Turkestan.

Leclère (A.) Trois contes Cambodgiens. (Ibid., 129–139.) Tales of the adventures of the Guru Parumarta.

Martinengo-Cesaresco (E.) The Hebrew conception of animals. (Open Court, Chicago, 1901, XV, 110–114.) Argues that the Jews did not look on animals as "things" or mere automata.

Matignon (J.) Hystérie et "boxeurs" en Chine. (Rev. Scientif., Paris, 1901, 4e série, XV, 202–204.) The author considers the Chinese as "big children," and emphasizes their *naiveté*, credulity, suggestibility, and impulsiveness. In a sense they are hysterical, epileptoid. The "boxers," moreover, recruit from the very young.

von Schroeder (L.) Ueber die neuen Entdeckungen buddhistischer Alterthümer in Ost-Turkestan. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 119–126.) *Résumés* the discoveries of Buddhistic antiquities in Chinese Eastern Turkestan from the finding of the so-called Bower MSS. in 1889, noting the results of English and Russian explorations. The English collection at Rome contains 23 MSS., from the desert region of Takla Makan,—there are also 45 xylographic books, besides many coins and seals, terra-cottas, clay vessels, figures in stone, metal, etc. The Russian collections include several MSS. in Uigur and Chinese, but the chief results of Russian explorations have been the discoveries of wall-paintings and inscriptions in the cave-dwellings of this region.

Thomas (N. W.) On a pictorial representation of the wheel of life from Japan. (Man, London, 1901, 1–4.) Detailed explanation, with colored plate, of a Buddhist Wheel of Life (the print dates from 1850, but the picture itself is far older). The picture has many Chinese features about it. In Japanese wheels, as compared with Tibetan, the details of Hell, etc., are far simpler.

Zaborowski (M.) La Chine et les Chinois. (Rev. Scientif., Paris, 1901, 4e sér., XV, 161–170.) An historical, ethnographical study of "the oldest of all human societies," embracing more than one-fourth of mankind, from which the white race has yet much to learn. The author approves Schlegel's idea that there is some connection between the ancient astronomy of China and that of Chaldea, but recognizes the originality and development *in situ* of Chinese civilization. There has been much

Zaborowski — *Continued.*
mingling of races in the various regions of the empire, but the ancient type of the Chinese proper is best preserved, according to M. Zaborowski, in that of the Hakkas.

Indonesia, Australasia, Polynesia

Agostini (J.) Folk-lore du Tahiti et des îles voisines. Changements survenus dans les coutumes, mœurs, croyances, etc., des indigènes, depuis 70 années environ, 1829–1898. (Rev. d. Trad. Pop., Paris, 1900, XV, 65–96, 157–165.) A very interesting and valuable comparison of the customs and beliefs of the natives of Tahiti as recorded by Moerenhout in 1828, and as observed by the author during three years of personal observation. Costume, toilet, sex affairs, tales and legends, literature, mythology, religion, public and private manners, are treated.

Brown (J. A.) Stone implements from Pitcairn island. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 83–88.) The axes and chisels of basalt described and figured here are of great interest on account of their specialization in form,—some of them simulate curved copper axes or the medieval European battle-axe of iron. Certain of them suggest relationship with some of the stone implements of Easter island, a view further enforced by the existence on Pitcairn island of large stone images, sculptured pillars, rude carvings in relief on the face of cliffs and in caverns, etc., similar to those found upon Easter island. The author suggests "a racial connection between Easter island and Pitcairn in the past," and advises a search on the latter for tablets with inscribed letters or signs.

Bouchal (L.) Abergläubische Bräuche beim Hausbau in den Preanger-Regentschaften. (Mitth. d. Anthrop. Ges. in Wien, 1900, Sitzgber., 153–154.) Discusses, after Habbema, the house-building ceremonies of certain natives of Sunda. The brief Sundanese text of the rules of building is given with interlinear translation.

—— Indonesische Wertiger. (Ibid., 154–156.) A brief general discussion of werwolf-beliefs in Java, Celebes, etc., based on Knebel and Kruijt.

Calkins (C. G.) Prehistoric politics in the Philippines. (Land of Sunshine, Los Angeles, 1900, XIII, 392–406.) A well-illustrated article based on the writings of Padre Santa Inés (1676), Padre Chirino (1604), etc. At pages 394–395 the Filipino alphabet is given.

Chamberlain (A. F.) Philippine studies. I. Place-names. II. Folk-lore. III. The Tagal language. (Amer. Antiq., Chicago, 1900, XXII, 393–399; 1901, XXIII, 49–54, 145–148.) Discusses etymology of some 40 place-names; enumerates, from various sources, items of religious and social, animal and plant lore; gives Paternoster in Tagal with explanatory vocabulary.

Duckworth (W. L. H.) On a collection of crania, with two skeletons, of the Mori-ori, or aborigines of Chatham islands. With a note on some crania from the same islands now in the museum of the Royal College of Surgeons. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 141–152.) Describes, with tables of measurements, ten crania (males 8) and two skeletons. The results favor "an affinity with a Polynesian rather than with a Melanesian type," a view agreeing with that indicated by the Polynesian affinities of the weapons and implements of the Mori-ori. The Maori invasion of the Chatham islands in 1835 renders absolute certainty of the provenience of the material necessary before valid conclusions can be drawn.

Edge-Partington (J.) On the origin of the stone figures or incised tablets from Easter island. (Man, London, 1901, 9–10.) Brief review of papers of Thomson and Barclay. Author concludes that history of statues and meaning of inscriptions are no nearer solution than before.

—— Note on an object of unknown use from the Solomon islands. (Journ. Anthrop. Inst., London, 1900, XXX, N. S., III, Anthrop. Rev. and Misc., 37.) Describes, with plate, a *tindalo* representing a deceased ancestor.

—— Note on some feather-mats in the British Museum. (Ibid., 38–39.) Describes, with two plates, two mats and a feather coronet from Hawaii (?).

Fraser (J.) Some Indian words of relationship used by the Australian tribes. (Amer. Antiq., Chicago, 1901, XXIII,

Fraser — *Continued.*
89–98.) The author, who holds that the Australians and Melanesians are the descendants of the original stratum of population in the Indo-Pacific region, after whom came Caucasians, then Malays, seeks to prove the existence of an Indian element in the languages of Australia, etc., seen especially in certain terms of relationship. The "aboriginal blacks" of southern Hindustan he believes to be the close kin of the Australians. The case is more venturesome than proved.

Hahl (*Dr*) Mittheilungen über Sitten und rechtliche Verhältnisse auf Ponape. (Ethnol. Notizbl., Berlin, 1901, II, 1–13.) Brief account, by the Vice-Governor, of religion, beliefs about the soul, social classes, titles, family and property law among the natives of Ponape, one of the Carolines. This paper is followed by a lengthy discussion (pp. 14–40) apparently by A. Bastian.

Karutz (*Dr*) Weitere Bemerkungen zur Ethnographie der Matty-Insel. (Internat. Arch. f. Ethnogr., Leiden, 1900, XIII, 217–223.) According to the author the Matty Island people are "a Polynesian *enclave* of Melanesia." Race-mixture and foreign influences exist, but originality has not been extinguished. Matty culture shows Caroline Islands affinities.

Rae (John) Laieikawai: A legend of the Hawaiian Islands. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 241–266.) A story "possessing the compass of a modern novel," the chief part of which is printed from a MS. of the late Dr John Rae dating *circa* 1855. The text differs in some respects notably from that given in King Kalakaua's Legends and Myths of Hawaii, and Dr Rae gives the *mele* or song of the sisters which does not appear in the book, being only alluded to there. The tale takes its name from the heroine, and may be four hundred years old, probably less.

Rivers (W. H. R.) A genealogical method of collecting social and vital statistics. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 74–82.) This essay, with the two genealogical charts (one from Murray island, the other from Mabinag), exemplify the possibility of collecting social and genealogical data from uncivilized races such as those of Torres straits, where Dr Rivers' researches were carried on. Such data will be a welcome aid to the thorough study of kinship systems, while at the same time they illustrate the social customs, etc., connected with names. The "genealogical method" is a means for utilizing "the store of information which the extraordinary memory for detail of the savage has enabled him to accumulate." The savage's memory for names "is as highly developed as in any European, and far more so than in those Europeans who are accustomed to abstract thinking."

Sierich (*Dr* O.) Samoanische Märchen. (Internat. Arch. f. Ethnogr., 1900, XIII, 223–237.) First part, with good introduction, of a collection of Samoan tales made on the spot by the author. Text in native language and accurate translations are given. The *Tagogos*, or poetic tales here recorded antedate missionary influence. One of the three tales published in this article is concerned with albinos.

Zdekauer (A.) Ueber Schädeltrepanationen im Bismarck-Archipel. (Mitth. der Anthrop. Ges. in Wien, 1900, Sitzgber., 116–117.) Describes (three are figured in the text) four trepanned skulls from the Bismarck archipelago. The operation is performed with a stone chisel.

AMERICA

Anthony (Frances). An Indian well. (Land of Sunshine, Los Angeles, 1901, XIV, 121–125.) Describes, with illustrations, an Indian well (an old camp-site) in the Colorado desert.

Ayer (*Mrs* E. E.) Early western history. Benavides's Memorial, 1630. (Ibid., 1900, XIII, 345–358, 435–444; 1901, XIV, 39–52, 137–148.) Continuation of this valuable translation of an important ethnographic document, rendered indispensable by the editorial notes of Chas. F. Lummis and the annotations of F. W. Hodge.

Bagley (W. C.) On the correlation of mental and motor ability in school-children. (Amer. Journ. Psychol., Worcester, 1901, XII, 193–205.) From studies of some 160 Madison (Wis.) school-children the author "does not find such a direct relation between weight and mental ability as Porter found in

Bagley — *Continued.*
his investigations upon St Louis school-children." A "significant trend toward an inverse relation between mental ability and head-girth" is noted. Boys slightly surpass girls in motor, but not in mental, ability.

Barrows (D. P.) The desert of the Colorado. (Land of Sunshine, Los Angeles, 1900, XIII, 312–322.) Contains some references to the Coahuia Indians.

Barrows (Mabel H.) "Hiawatha" among the Ojibwa Indians. (Southern Workman, Hampton, Va., 1901, XXX, 771–776.) Account of "Hiawatha," pantomimic tableau performed by the Indians of Garden river, Ontario, for the benefit of the family of Longfellow. The performance was "rather a reminiscence of their own early life than an adaptation of the poem."

Beauchamp (W. M.) Onondaga tale of the Pleiades. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 281–282.) Recounts the origin of the seven stars from "a pretty band of dancing children." The moral is "feed children well." The Pleiades are the favorite constellation of the Iroquois.

Benedict (A. L.) Mound-builder remains on Cattaraugus creek, Erie county, N. Y. (Amer. Antiq., Chicago, 1901, XXIII, 99–105.) Account of character and contents of two mounds, investigated by the author (for the Pan-American Exposition) in August and September, 1900. A sacrum found in one of these mounds is conjectured to belong to a musk-ox (?). A map and plans accompany the article.

Blue (A.) Notes on skulls taken from a pre-historic fort in Kent county. (Proc. Canad. Inst., Toronto, 1901, II, 93–95.) Describes briefly (a few measurements are given) seven skulls from an ossuary not far from the shore of Lake Erie in Kent county, Ontario. Two different Indian races are represented, and the tree-circle method indicates a period for the oldest burial antedating the Columbian discovery by about a century.

Boas (Franz) A bronze figurine from British Columbia. (Bull. Amer. Mus. Nat. Hist., N. Y., 1901, XIV, 51–52.) Description (with plate) of specimen found at Kincolith in northern British Columbia, whither it probably passed by way of the Manila-Acapulco trade some time before the close of the eighteenth century. The object in question seems to be the handle of a ghaṇṭâ, or bell used by the Brâhmana in the Pûjâ ceremony.

Brinton (D. G.) Catalogue of the Berendt linguistic collection. (Bull. Free Mus. Sci. and Art, Phila., 1900, II, 203–234.) Briefly describes 183 books and MS. (mostly the latter), now in the Library of the Free Museum of Science and Art, University of Pennsylvania, relating to the languages of Mexico and Central America. Printed as the late Dr Brinton left it.

Burns (L. M.) "Digger" Indian legends. (Land of Sunshine, Los Angeles, 1901, XIV, 130–134.) First part of an account of legends of the Scott Valley Indians of northern California: "Why the Animals are Warm-Blooded," and "The Stealing of the Fire."

Campbell (R. F.) Classification of mountain whites. (Southern Workman, Hampton, Va., 1901, XXX, 110–116). Rather popular account of the various classes of the inhabitants of "Appalachian America." The author holds to the "driftwood" or "deposit" theory of the origin of these people.

Chamberlain (A. F.) Some items of Algonkian folk-lore. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 271–277.) Alphabetical enumeration, with explanatory comments, of folk-lore items from Cuoq's Lexique de la langue algonquine.

Chamberlain (Lucia S.) Plants used by the Indians of eastern North America. (American Naturalist, Boston, 1901, XXXV, 1–10.) Enumerates (in some cases the Indian names are given) plants used by the various tribes of the Iroquois and Algonquians for food, medicine, ornament, artistic and manufacturing purposes, etc. The arrangement of plant-names is alphabetic under each tribe-name, and a bibliography of 40 titles is appended.

Cibele (Angela N.) Folk-lore di San Paulo nel Brasile. Alcune parole usate dalla populazione mista Italiana e Negra nelle "fazende" di S. Paulo nel Brasile. (Arch. p. l. Stud. d. Trad. Pop.,

Cibele — *Continued.*
1900, XIX, 18–24.) Last article on the topic. An alphabetic list of words in use among the Italian-Negro population of the "fazendas" of S. Paulo, Brazil. The list contains a number of words of Indian origin.

Culin (S.) The Dickeson collection of American antiquities. (Bull. Free Mus. Sci. and Art, Phila., 1900, II, 113–168.) Account of archeological investigations of Dr M. W. Dickeson in 1842–1843 in Mississippi and Louisiana, with a list of the specimens from his collection now in the Free Museum. Many of the mounds described have long since disappeared.

Dalton (O. M.) Note on a stone figure from Colombia, S. America. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 64.) Very brief account (with two plates) of statue of warrior, pre-Columbian in date, and obtained in 1899 from San Augustin. These statues are said to be quite numerous in the region about the upper Magdalena river.

—— Note on a copper shield from the N. W. Coast of America. (Ibid., 47.) Very brief account (with figure) of *tau*-shield from Stickeen tribe.

Dixon (R. B.) The musical bow in California. (Science, N. Y., 1901, N. S. XIII, 274–275.) Notes the occurrence of a form of this instrument among the Maidu Indians, used by shamans. Author favors Amerindian origin of musical bow.

—— Some Coyote stories from the Maidu Indians of California. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 267–270.) Four tales,—"Coyote and Grizzly Bears," "Coyote and Fleas," "Coyote and the Gray Fox," "How the Coyote Married his Daughter,"—collected in 1899 from the Koyoma or Maidu of the Sierra.

Dorsey (G. A.) The Stanley McCormick Hopi expeditions. (Science, N. Y., 1901, N. S. XIII, 219–222.) Brief account of the expeditions of 1899–1900 for the exploration of the Hopi or Moqui ruins and of the Hopi material now in the Field Columbian Museum, Chicago.

—— An aboriginal quartzite quarry in eastern Wyoming. (Field Columb. Mus., Chicago, Dec., 1900, Anthrop. Ser. II, 232–243.) Describes, with 12 plates, the situation, condition, and products of an aboriginal quartzite quarry in Converse county, Wyoming. The quarry belonged to some tribe of Plains Indians, and dates "within a comparatively recent period, but before the advent of the white race in this region."

—— Games of the Makah Indians of Neah bay. (Amer. Antiq., Chicago, 1901, XXIII, 69–73.) Describes 11 games upon information derived from intelligent young Indian. The materials used in these games bring out notably the effect of seashore environment. Interesting is the modification "from the original buckskin ball of the Plains or Mountain Indians to a ball of whalebone." The game itself, in this case, "has become intimately bound up with the celebration of the capture of a whale."

Doubleday (N. de G.) Aboriginal industries. (Southern Workman, Hampton, Va., 1901, XXX, 81–85.) Argues for the preservation and revival of Indian arts, some of which are now lost or nearly so, by the adaptation of Indian industry to white men's needs.

Dowde (J.) Art in negro homes. (Ibid., 90–95.) General account of the art-contents of 25 negro homes in the city of Durham, N. C.

Duckworth (W. L. H.) and **Pain** (B. H.) A contribution to Eskimo craniology. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, 125–140.) This article (furnished with tables and two plates) gives the results of measurements of eleven adult males and ten adult females (Labrador Eskimo on exhibition in London in the winter of 1899–1900), compared with those of from seventeen to twenty skulls of adult males and from eight to eleven skulls of adult females (all eastern Eskimo). Ten Eskimo skulls in the Anatomical Museum at Cambridge are also included. At the end of the article are some "Miscellaneous Notes" by Mr R. G. Taber on these Labrador Eskimo. Among the peculiarities noted with more or less frequency in Eskimo skulls are: Scaphocephalism, persistence of certain sutures, asymmetry of *foramen magnum*, wearing down of teeth, thickening of body of mandible,

Duckworth — *Continued.*
etc. Early appearance of certain characteristics (retention of infantile characters) also occurs.

Edge-Partington (J.) Floats for alluring salmon, from the north end of Vancouver island. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 49.) Brief description, with figures, from lists in British Museum.

Fewkes (J. Walter) A theatrical performance at Walpi. (Proc. Wash. Acad. Sci., 1900, II, 605–629.) A good description (with three plates) of the six "acts" and occasional additional performances of "the great serpent drama" of the Hopi Indians, as rendered at the Pueblo of Walpi in the spring of 1900. The paper includes also notes on paraphernalia, a *résumé* of events in the Palûlûkoñti ceremony, and interesting views of the significance of primitive drama. The drama here described is "in the main, theatrical and secular, performed for instruction or entertainment." An important point is Dr Fewkes' belief that "the Great Serpent cult in Tusayan and among the Toltecs had a common origin," the Tlapallan of the latter having been in southern Arizona, or northern Mexico.

Fletcher (Alice C.) Giving thanks: a Pawnee ceremony. (Journ. Amer. Folk-Lore, Boston, 1900, XIII, 261–266.) Interesting account — the rite has seldom, if ever, been witnessed before by members of the white race — of a ceremony of thanks to Tiráwa (the chief deity of the Pawnees) "for power granted to medicine given by an old priest to the wife and child of a young man." Belief in the efficacy of medicine, position of doctor, meaning and purpose of fees are touched upon.

Gérin (L.) The Hurons of Lorette. (Trans. Ottawa Lit. and Scientif. Soc., 1899–1900, 69–92.) General historical and ethnographic discussion of forms of labor, property, and family. The author notes the intermarriage of Hurons with white women, and the potent influence of the latter; the alteration of the physical type of the old Hurons; the passing of the Huron language, and the old Huron dress, mode of living, etc. Of the Iroquois of Caughnawaga, as compared with the Hurons of Lorette, he says that the former "instead of being weakened by foreign intrusion have been strengthened by it" (p. 90).

Gleason (F. D.) Social life among the Indians. (Southern Workman, Hampton, Va., 1900, XXIX, 565–568; 1901, XXX, 156–159.) The first article treats of Indian hospitality and its survivals, the second of burials among the Omahas of eastern Nebraska.

Hagar (S.) The Peruvian star-chart of Salcamayhua. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 320–321.) Abstract of "the first of a series of articles upon the symbolic astronomy of the ancient Peruvians." The author considers the chart pre-Columbian.

Halbert (H. S.) Prehistoric earthworks in Noxubee county, Mississippi. (Amer. Antiq., Chicago, 1901, XXIII, 139–141.) Describes two "forts," probably built by the Choctaws as barriers against Muskogee invasion.

Hastings (W. W.) Anthropometric studies in Nebraska. (Amer. Phys. Ed. Rev., Boston, 1900, V, 53–66.) From study of 2500 school children of Lincoln, and 10,000 of Omaha, the author concludes that Porter's views as to correlation between intellectual and physical development are correct.

Hatcher (J. B.) The Indian tribes of southern Patagonia, Terra del Fuego, and the adjoining islands. (Nat. Geogr. Mag., Washington, 1901, XII, 12–22.) Notes on the Tehuelches, Onas of the Plains, Channel Indians, with illustrations (Tehuelche brave, squaw, etc.). The author notes that marriages of white men and Tehuelche women are more prolific than marriages of Indians. The effects of the advent of the horse are referred to. The Yahgans are considered a people who have been driven to the wall.

Holden (*Mrs* M. E. R.) A relic of Thayendanegea. (Papers and Records Ontario Hist. Soc., Toronto, 1901, III, 113–116.) Describes Capt. Brant's war-banner, ring, and watch.

Hunter (A. F.) The ethnographical elements of Ontario. (Ibid., 180–199.) The first attempt of any consequence to delimit ethnographically the settlement of the Province of Ontario according to race. The settlements or groups of the original rural population are given in tabular form. A valuable paper.

Johnson (J.) Canada's northern fringe. (Trans. Ottawa Lit. and Scientif. Soc., 1899–1900, 9–68.) A historical-geographical account of the "District of Franklin," by which name, since 1895, the Arctic islands belonging to Canada have been designated in honor of the famous explorer. The origin of many place-names is given.

La Flesche (F.) The Laughing bird, the wren. (Southern Workman, Hampton, Va., 1900, XXIX, 554–556.) Omaha story of how the wren defeated the eagle and won its name, *Kíthahaja*, the "laughing bird."

—— The story of a vision. (Ibid., 1901, XXX, 106–109.) A tale of Omaha boy-life.

Lehmann-Nitsche (R.) Ueber den fossilen Menschen der Pampaformation. (Corrbl. d. deutschen Ges. f. Anthrop., München, 1900, XXXI, 107–109.) Brief *résumé* of our present insufficient knowledge of fossil man in the Pampas. The author believes the pieces of burnt clay found in the middle *löss* to be of human origin.

Lewis (Frances W.) Life among the Pueblos. (Southern Workman, Hampton, Va., 1901, XXX, 757–760.) Brief general account of Indians of various pueblos of New Mexico and Arizona.

Lewis (T. H.) Sculptures in caves at St. Paul, Minnesota. (De Lestry's Western Mag., St. Paul, 1901, VI, 229–233.) Describes, with 12 figures in the text, sculptures of human beings, animals, etc., in Dayton's Bluff, Carver, and other caves within the city of St Paul. The sculptures in Carver Cave (of which but few were in good condition in 1878) were thought to be "very ancient" by Capt. Carver, who saw them in 1766. The author's investigations were made mostly in 1878, and it is fortunate that he made the copies here reproduced.

—— The De Soto expedition through Florida. (Amer. Antiq., Chicago, 1900, XXII, 351–357; 1901, XXIII, 107–111.) Abridged translation, with notes, of the Ranjel-Oviedo account of the expedition of 1839.

McGee (W. J.) Amerind—A designation for the aboriginal tribes of the American hemisphere. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 44–45.) A brief account of the origin of *Amerind* and reasons for its adoption.

McGhee (Z.) A study in the play-life of some South Carolina children. (Pedag. Sem., Worcester, 1900, VII, 457–478.) Detailed account of the age and sex relations of 134 games of all sorts as played by 8,718 South Carolina children, 6–18 years old.

Mason (O. T.) Traps of the Amerinds: a study in psychology and invention. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 301–313.) This excellent paper has appeared in full in the American Anthropologist, 1900, II, 657–675. It deals with all aspects of the trap among the American Indians.

Nuttall (Zelia) The meaning of the ancient Mexican calendar stone. (Ibid., 320.) Brief abstract. Author holds that "a single, primitive cosmical scheme and plan of government prevailed through ancient America, this scheme being identical with the primitive Old World scheme.

Patrick (G. T. W.) The psychology of profanity. (Psychol. Rev., N. Y., 1901, VIII, 113–127.) General discussion of the history and nature of profanity. According to the author "the human analogue of the [animal] growl or roar of anger is the profane oath." Profanity is a form of instinctive reaction.

Peet (S. D.) Architecture in the stone age. (Amer. Antiq., Chicago, 1900, XXII, 367–382.) Illustrated discussion of buildings of the "stone age," chiefly in North America. The author holds to the Mongolic affinities of the ancient Babylonians.

—— Toltec cities and Toltec civilization. (Ibid., XXXIII, 1901, 33–47.) Illustrated article of general nature. Author takes too high a view of "Toltec" culture.

—— Mexican and Maya architecture. (Ibid., 113–136.) General discussion, with numerous illustrations, of the resemblances and differences of Mexican and Central American architecture. The author thinks the ancient Mexicans borrowed much from the Mayas.

Pepper (G. H.) The Navajos. (Southern Workman, Hampton, Va., 1900, XXIX, 639–644.) Brief ethnological sketch. According to the author, "the

Pepper — *Continued.*
sheep that the Spaniards introduced were destined to work out the Navajos' salvation."

Preuss (K. T.) Der Affe in der mexikanischen Mythologie. (Ethnol. Notizbl., Berlin, 1901, II, 66–76.) In this paper, which is accompanied by 43 figures in the text (from pottery, codices, etc.), the author discusses the rôle of the monkey in ancient Mexican mythology. The "monkey ear" of certain figures, monkey-shaped rattles and bells, the connection of the monkey with *pulque*, with death, with fertility and the earth, etc., are touched upon.

Rakestraw (C. D.) The Shaker Indians of Puget sound. (Southern Workman, Hampton, Va., 1900, XXIX, 703–709.) Brief general account of John Slocum, the founder of the "Shaker religion" among the Puget Sound Indians, and the system itself, "a combination of Protestantism, Catholicism, and Christian Science." The author writes from personal observation.

Riggs (F. R.) Peculiarities of Indian education. (Ibid., 1901, XXX, 66–71.) Discusses some of the peculiarities of Indian children in the schoolroom. Notes the power of custom and habit. According to the author the Dakota *hanke* acquired its present meaning of "half" from the whites, having meant originally "part" only.

Rogers (F. K.) The rain-dance of the Arapahoes and Cheyennes. (Ibid., 1900, XXIX, 721–723.) Brief account of dance as performed by these Indians near El Reno, Oklahoma.

Rowe (G. C.) The negroes of the Sea islands. (Ibid., 1900, XXIX, 709–715.) Brief general sketch of present conditions of the negroes of the South Carolina coast islands.

Russell (F.) Studies in cranial variation. (American Naturalist, Boston, 1900, XXXIV, 737–745.) Gives results of examination of some 2000 Amerindian skulls, in the Peabody Museum at Harvard, as to metopic suture, tympanic exostoses, frontoparietal, parietal, epactal bone, platybasis, jugular process, Aymará fossa, fused atlas, *torus palatinus*. Statistical tables and two pages of illustrations are given.

Slocum (C. E.) A civilized heredity stronger than a savage environment. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 316–317.) The author considers the thesis proved by the history of Frances Slocum, taken captive by the Delawares in 1778, and for 59 years resident in an Indian environment. Here heredity triumphed psychically, and in one of the youngest great-granddaughters from Indian marriages "the dark auburn hair of the captive" appears atavistically.

Smith (Harlan I.) The archæology of the southern interior of British Columbia. I. Introduction. (Amer. Antiq., Chicago, 1901, XXIII, 25–31.) Treats of geography, archeological sites, resources of the prehistoric peoples of the region about Lytton, Spences Bridge, and Kamloops. The paper is extracted from Vol. II of the Memoirs of the American Museum of Natural History.

—— The cairns of British Columbia and Washington. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 313–315.) Abstract. See next title.

Smith (H. I.) and **Fowke** (G.) Cairns of British Columbia and Washington. (Mem. Amer. Mus. Nat. Hist., N. Y., Jan., 1901, IV, Anthrop., III, ii, 56–76.) This excellent memoir, with map, 5 beautiful plates, and 9 figures in the text, describes with detail nature and contents of numerous cairns on southeastern Vancouver island, the San Juan group, and Whidbey island, which antedate the coming of the whites. A careful and well-digested study.

Smyth (J. H.) Negro criminality. (Southern Workman, Hampton, Va., 1900, XXIX, 625–631.) Appeals for reform in home-training as a preventive of crime.

von den Steinen (K.) Der Paradiesgarten als Schnitzmotiv der Payaguá-Indianer. (Ethnol. Notizbl., Berlin, 1901, II, 60–65.) This interesting paper, with four illustrations, describes the carvings on four "medicine-pipes" of the Payaguás now in the Ethnological Museum. The carvings represent the Paradise of the Old Testament, doubtless after missionary ideas rudely assimilated.

Strobridge (Idah M.) Lo's Turkish bath. (Land of Sunshine, Los Angeles,

Strobridge — *Continued.*
1901, XIV, 13–19.) Describes, with illustrations, the "sweat house" of the Piutes.

Trotter (C.) Extracts from the diary of Mr James Strange, H. E. I. C. S., commanding an expedition sent by the East India Company to the northwest coast of America in 1786; with a vocabulary of the language of Nutka Sound. (Journ. Anthrop. Inst., London, 1900, XXX, N. S. III, Anthrop. Rev. and Misc., 50–62.) Pages 50–58 are occupied with extracts from the diary, pages 56–61 by "Additions to Captain Cook's Vocabulary of the Nootka Sound language," pp. 61–62, by a "Vocabulary of the Prince William's Sound language," and there are added to the article brief "Notes on the above vocabulary" by N. W. Thomas. Mr Strange's word-list "is four times as numerous as Captain Cook's, and includes the numerals." Mr Coutts Trotter is the grandson of Mr Strange. The diary and vocabulary seem never to have been published, so the added linguistic material is very welcome.

Upham (W.) Derivation and antiquity of the American race. (Amer. Antiq., Chicago, 1901, XXIII, 81–88.) Author gives his reasons for believing that "the first American peoples migrated to our continent from northeastern Asia during the early Quaternary time of the general uplift of northern regions," and this inflow of man spread south to Cape Horn, mingling on the way with "another line of very ancient immigration, in the same early Pleistocene or Quaternary time, from Western Europe."

Wardle (H. N.) Notes on the designation *Atna*. (Ibid., 137–139.) Sums up the evidence as to the Atna or Ahtenné. Author concludes that there are "two tribes known as Atnah, one to the northwest, the other in the southwest, a Tinné and a non-Tinné people." The name *Atna* seems to be related to *gáelt'un*, "glacier," in certain Athapascan dialects, hence perhaps "glacier people."

—— The Sedna cycle: a study in myth evolution. (Proc. Amer. Assoc. Adv. Sci., Easton, Pa., 1900, XLIX, 317–318.) Abstract of a paper published in full in the American Anthropologist, 1900, II, 568–580.

Willoughby (C. C.) Prehistoric workshops at Mt Kineo, Maine. (American Naturalist, Boston, 1901, XXXV, 213–216.) Gives an account, with three plates, of the results of two investigations of the porphyritic felsite rejects and other relics about the great cliff of Mt Kineo. The condition of the material indicates that the process of finishing was undertaken after transportation to other places. The presence of completed implements of material derived from Mt Kineo all over the valleys of the Kennebec and Penobscot corroborates this view.

Wintemberg (W. J.) German-Canadian folk-lore. (Papers and Records Ontario Hist. Soc., Toronto, 1901, III, 86–96.) Items of folk-lore from the German population of Ontario, relating to folk-medicine, luck, weather, fauna and flora of the country, heavenly bodies, thunder and lightning, holidays, witchcraft, etc.

Work (M. R.) Crime among the negroes of Chicago. (Amer. Journ. Sociol., Chicago, 1900, VI, 204–223.) Statistics 1872–1897 are discussed according to sex, age, offences. Author holds that "the fact of the negro being in a transitional state, and the economic phase of this transition, account for a large part of the excess of negro crime in the United States."

NOTES AND NEWS

Archeological Survey of Michigan.[1]—Owing to the desire on the part of students for such study and to support by Prof. Francis W. Kelsey of the Latin department, a full course in museum work in American archeology was offered at the University of Michigan under Prof. Kelsey's general direction, beginning the second semester in the college year 1891–92.[2] Two students availed themselves of this opportunity and some of the laboratory work was done on Michigan material. Regular university credits were given in both that year and the one following, but the course is no longer offered.

In 1893 and 1894, as a direct outgrowth of the interest in the course and the coöperation with the university of the Detroit branch of the Archeological Institute of America, several surveys were made of the prehistoric earthworks known as "garden beds" near Kalamazoo. From these data one of the groups was modeled for the University museum, and copies were taken by the Peabody Museum and the American Museum of Natural History.

The Michigan Academy of Science was organized in the fall of 1894 and at the first meeting, December 26, 1894, the anthropology of the state was represented by a paper on one branch, "The Data and Development of Michigan Archeology." This paper was published in two parts; the first, referring to the data, together with a note predicting future activity on the part of the state in the preservation and study of its archeologic resources, appeared in *The American Antiquarian*, May, 1896, while the second, referring to the development of Michigan archeology, was published simultaneously at the University in *The Inlander*. This paper pled for the subject, suggesting a general plan of action, particularly that the work be systematic and directed by some public institution, such as the State University, where the results could be assembled for study and permanent free public exhibition; and that the antiquities of the state should be photographed, surveyed,

[1] Presented before the Michigan Academy of Science at its seventh annual meeting, Ann Arbor, March 28, 1901.

[2] See "Anthropological Work at the University of Michigan," *Memoirs of the International Congress of Anthropology*, Chicago, 1894; also *University Record*, February, 1894.

and plotted. Later a plea for inclosing mounds in public parks, cemeteries, etc., was published in the local papers.

In 1900 the Detroit branch of the Archeological Institute of America appointed a committee composed of James E. Scripps, owner of the *Detroit News-Tribune;* Prof. Francis W. Kelsey, of the University of Michigan; George W. Bates, President of the Detroit Archeological Society; Hon. William E. Quinby, owner of the *Detroit Free Press;* and Levi L. Barbour, and instructed it to prepare and to have passed by the state legislature a bill establishing a survey of the antiquities of Michigan and to make appropriations therefor. After careful consultation with members of the American Museum of Natural History, Bureau of American Ethnology, and United States National Museum, as well as with those who conducted the archeological exploration for the New York State University and the Ohio Historical Society, this bill was prepared.

At the meeting of Section H of the American Association for the Advancement of Science, at Johns Hopkins University in 1900, a committee was appointed to transmit a suitable memorial to the people of Michigan, expressing approval of the establishment of the proposed survey and tendering its coöperation.

The following is a copy of the memorial transmitted:

To the Senate and House of Representatives of the General Assembly of the State of Michigan:

RESOLVED: by Section H of the American Association for the Advancement of Science, at its meeting held at Baltimore, December 28–29, 1900, that the proposed Archeological Survey of the state of Michigan is highly desirable; that we approve the same and hope it will soon be pushed to completion. We recommend that the work be placed in charge of an experienced archeologist, with an advisory board of archeologists the members of which shall serve without pay, the results of which inquisition to be preserved by publication.

THOMAS WILSON, *Chairman.*
GEO. A. DORSEY, FRANK RUSSELL } *Members of Committee.*

The bill which was presented early in the present year is as follows:

A BILL *Establishing a survey of the antiquities of Michigan and making appropriations by fiscal years therefor.*

The People of the State of Michigan enact:

SECTION 1. That a survey of the antiquities of Michigan be and the same is hereby established.

SECTION 2. That the survey shall be in charge of a commission comprising the Governor of the State ex officio, the President of the University of Michigan, the President of the Michigan Academy of

Science, the President of the Pioneer and Historical Society, and the President of the Detroit Archeological Society, this commission to serve without compensation, but to be reimbursed for their actual and necessary expenses.

The commission shall have the power to employ an archeologist and one or more assistants and to make such incidental expenditures as the nature of the work may require. The accounts for salaries and other expenses provided herein shall be paid upon the warrant of the Auditor-General monthly upon the approval of the Governor. At the end of each fiscal year the commission shall cause to be made an annual report, the copy for which, as soon as completed, shall be forwarded to the clerk of the Board of State Auditors for publication by the State Printer, the expense of such publication to be paid from the general fund of the State upon the allowance of the Board of State Auditors.

SECTION 3. For the purpose of carrying out the provisions of this act, exclusive of the cost of publishing the annual reports, there is hereby appropriated from the general fund of the State for the fiscal year ending June thirty, nineteen hundred and two, and each fiscal year thereafter, the sum of two thousand five hundred dollars.

The committee on state affairs has reported the bill favorably, but it has been amended by limiting it to two years. This will require a somewhat different mode of field work and an effort to have the survey perpetuated at the end of two years either by state or private aid. The bill is now in the hands of the committee on ways and means.

Should the bill pass it will be necessary to enlist the services of an archeologist to direct the survey who not only has field experience and will avoid the pitfalls so often fatal to such undertakings, but one who can also bring about the reëstablishment of anthropologic work in the University curriculum. The latter important object could easily be effected by offering a few lectures the first year, supplemented the second by laboratory work on the results of the survey. This plan would not only furnish material for the students, but would further the interests of the survey by their preparation of its material. These students could later be employed in special field research during the summer, and in the laboratory prepare the material and collate the results for theses. The director should also give popular lectures throughout the state in order to develop general interest in the subject.

Should the bill fail to pass it is still significant that interest in the subject should have reached this stage. With the large number of influential and thoughtful people now striving for this survey as part of a permanent anthropological institution in Michigan, and with the increased public interest which they have aroused, the subject has now a larger constituency in the state than ever before.

HARLAN I. SMITH.

Twined Weaving.— In Professor Mason's note on "Woven Basketry: a Study in Distribution," on pp. 771–73 of the last number of the *American Anthropologist*, he gives the geographical distribution of twined weaving in America as follows: "It commences with the island of Attu and continues down the Pacific coast of America to the borders of Mexico with some interruptions, and extends into the Great Interior basin with the Ute. Otherwise it does not exist in North America excepting in association with prehistoric pottery in Pope county, Tennessee, in Macon, Georgia, in Arkansas, and in Illinois, as may be seen by examining Holmes' illustrations in the *Third Annual Report* of the Bureau of Ethnology, pp. 408–413."

He also refers to figures of twined weaving in Holmes' paper in the *Thirteenth Annual Report* of the Bureau of Ethnology, and, continuing, says: "There is not a specimen in the United States National Museum of any sort from Central or South America. In the codices as well as in the beautifully illustrated books of Stübel, Reiss, and Uhle, not one example contains this compound weft. In other words, in my limited study, no twined weaving was ever done in America south of the present boundary of the United States."

The simplest form of twined weaving (style A) in which the warp elements form the body of the cloth, mat, or basket, and in which the twisted woof elements, placed at intervals, are used simply to bind the warp elements together, is probably one of the earliest and most widely distributed forms of weaving. We must seek its origin in fish weirs and other coarse wattle-work where inflexible rods were held firmly in rows by twisted twigs or vines. It was probably applied to the finer forms of basketry and matting later, and its use in holding together untwisted bast and the fiber of plants, as well as cords of twisted vegetal fiber must have occurred in the very first stages of cloth manufacture.

In the second form of twined weaving (style B) the twisted pairs of woof elements are pressed close together and the warp elements do not show conspicuously. This style was applied principally to basketry but was also used in the manufacture of cloth.

Of the more complicated forms of twined weaving the Peabody Museum possesses excellent examples, principally from the area given by Professor Mason. The following localities represented by collections in the Peabody Museum at Cambridge, showing distribution of the two simpler forms, may be added to Professor Mason's list:

Iroquois Indians, cornhusk basketry (style B); Mounds of Ohio, charred cloth (styles A and B); Prehistoric burial caves, State of Coahuila, Mexico, cloth and matting, several examples (A); Tlaxcala Indians,

central Mexico, sling (B); Prehistoric graves at Ancon, Peru, matting both coarse and fine (A), baskets (B); Prehistoric graves at Arica, Chile, small wallets of basketry (A); Graves at Pisagua, Chile, basket (A); Guato Indians, southern Brazil, excellent examples of Mosquito mantles (A); Cadiuéios Indians, Paragua river, southern Brazil, grass bags (A).

Outside of America the Peabody Museum shows examples of twined weaving from the Swiss lakes (style A), Egyptian graves (A), central Africa (A), China (A and B), Japan (A), Ainos of Japan (A), New Zealand (A), Australia (A), Marshall islands (B), and the Society islands (A and B).

It is also interesting to note the survival of the simplest form of this weaving in various objects of everyday use—our ordinary wicker wastepaper baskets and crates for shipping crockery and similar material serving as examples.

C. C. WILLOUGHBY.

A Correction.—On page 773, volume II, of this journal I use the language, "In my limited study no twined weaving was ever done in America south of the present boundary of the United States." The absence of this technic from more than half of the Western Hemisphere is indeed surprising, but since writing the sentence at the head of this paragraph I have found drawings of twined basketry from Peruvian graves in the *Eleventh Annual Report* of the Peabody Museum, pp. 280, 291, 292. One of the drawings shows the style of crossed warp such as one sees in cedar-bark baskets on the coast of British Columbia.

O. T. MASON.

Artifacts from Norse Ruins. — I regret the necessity of calling attention to the unfortunate error that has crept into the article by Mr Gerard Fowke on "Points of Difference between Norse Remains and Indian Works most Closely Resembling them," published in vol. II, No. 3, of this journal. On page 562, speaking of the "lack of the slightest trace of bone or any object which shows the least indication of" the artificiality of the "Norse graves" at Clematis Brook, near Cambridge, Mr Fowke says: "The same statement is true in regard to the graves of Iceland and Greenland, and not only of the graves in these countries, but also of the house sites." The author has evidently overlooked even Miss Horsford's statements in the article which he cites (*National Geographic Magazine*, March, 1898, p. 81), not to mention the sources from which that information is drawn (V. Boye, "Beskrivelse af og Fortegnelse over de ved Premier-lieutenant D. Brunn i Nordboruinerne

fremgravede Oldsager," *Meddelelser om Grønland*, 16de Hefte, and G. F. Holm, "Beskrivelse af Ruiner i Julianehaabs Distrikt, pp. 119, 136, etc., ibid., 6te Hefte).

I quote from Miss Horsford's "Dwellings of the Saga-time": "Numerous relics have been found in these ruins [of Greenland]—iron nails and knives, pieces of stone vessels, spinning stones, bone combs, and stone pendants, bored with holes and incised with runelike but illegible characters." The following is from the résumé of Lieutenant Holm's work, p. 211: "In the cemetery of Kagsiarsuk, in the Igeliko fjord, lay at a slight depth many bodies, placed quite near together under great stones, as if in a family tomb. These bodies, of which the heads were turned toward the west, seemed not to have been extended, but folded upon themselves, and there was no trace of coffin or grave-clothes. At Ikigaet, on the contrary, where bodies have been found interred at greater depth, they were lying in caskets joined with wooden pegs but without cover, and clothed in sheets of brown woolen stuff. The coffins contained also little crosses of carved wood." Such graves do not present the same type as the hypothetical ruins of Massachusetts. Now, when even Longfellow's famous "Skeleton in Armor" seems to have spoken an Algonquian tongue, it were well to move cautiously. The question of the long occupancy of the New England coast by the Northmen is, I believe, still an open one, and ground is lost rather than gained by a slip like the one in question.

H. Newell Wardle.

Academy of Natural Sciences, Philadelphia.

With Miss Wardle's permission her communication was referred to Mr Fowke, who responded as follows:

"The article to which Miss Wardle refers was written soon after the excavations were made at Cambridge. It was considerably changed from its original form when sent to the *Anthropologist*, hence is not so clear on some points, perhaps, as it should be.

"My information in regard to Norse remains, except about Cambridge, is entirely second-hand. In speaking of graves elsewhere, I had in mind only the small circular cairns. Having been told that no remains occurred on the hut-sites in Greenland, I took it for granted—'jumped to the conclusion,' perhaps,—that specimens found there, as mentioned in the *National Geographic Magazine* and enumerated by Miss Wardle, were left by people occupying the site at a date later than Lief's time; that such was the meaning of the words 'attributed by the Danes to a period later than the Saga time.' Thanks for the correction."

Gerard Fowke.

"The Skeleton in Armor"; was it Norse or Indian?— With many people Longfellow's poem, with its prefatory note of "a skeleton clad in broken and corroded armor," has been held as proof indubitable of the presence of the Norsemen in New England. The word armor brings up visions of breastplates and bucklers, visors and helmets, with all the protective paraphernalia of the martial men of the middle ages; then, too, metallic armor was unknown among the New England Indians.

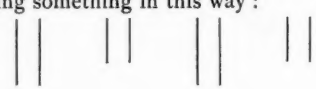
In the winter of 1897 it was my good fortune to hear Mrs Julia Ward Howe give one of her delightful parlor lectures on her personal recollections of Longfellow, Whittier, Lowell, and Emerson, in which she told of the circumstances which led to Longfellow's writing of the poem in question. At that time Mrs Howe's family were living in Newport; her brother, Mr Sam Ward, and Mr Longfellow were intimate friends, and the poet often visited at their home. On one occasion Mr Ward called the poet's attention to a recent interesting discovery of a skeleton with brass tubes upon its chest which was preserved in a private museum at Fall River, suggesting it as a fine subject for a poem. While on his return journey to Boston Mr Longfellow visited the Fall River museum and the poem of "The Skeleton in Armor" was the result. Soon after his visit the museum and all of its contents were destroyed by fire.

The description of the armor as having been composed of "brass tubes" was highly suggestive to me. A few days later I wrote to Mrs Howe, enclosing an extract from an early writer on New England, asking if it described the so-called armor. The quotation was to this effect: "An Indian with a bandolier of copper tubes upon his chest, and another about his middle, will strut about thinking himself the equal of King Charles." There are many allusions in early writings to copper tubes strung upon sinew or fiber and worn as a highly-valued ornament by the Indians.

Mrs Howe's reply settles the question of Norse armor or Indian ornament. It is as follows:

"My dear Mrs Eaton:

"You must remember that it is about sixty years since I saw the *skeleton* at Fall River. I think, however, that what was called its armor corresponded very much to the description quoted in your letter. It was composed of hollow pieces of metal, like reeds, of various lengths. The color led me to suppose that this metal was brass. I remember it as of a light yellow color. The pieces seemed to be strung on a fiber of some sort, hanging something in this way:



but closer together, one set of these being on the breast, the other across the abdomen, the figure in a kneeling or crouching posture.

"Wishing that I could tell you more about it, believe me

"Yours sincerely,

"JULIA WARD HOWE.

"*Boston, May 10th, 1897.*"

The method of burial in a "crouching posture" is also an evidence of the skeleton having walked the earth as an Algonquian Indian.

Much can be allowed to "poetic license," but, when poems are quoted as proof of historic facts, it is well to investigate the data upon which they are founded. In this case Mrs Howe's recollections seem to have settled the question.

HARRIET PHILLIPS EATON.

Death of Colonel Hilder.—Frank Frederick Hilder was born in Hastings, England, in 1836 ; he died in Washington, January 31, 1901. After a course at Rugby young Hilder entered the military school at Sandhurst, whence he was graduated. Entering the British army as a cornet, he was sent to India where, through conspicuous gallantry, he was awarded the Mutiny medal, with special service bars for Delhi and Lucknow. While thus engaged in the military service his attention was directed to the manners and customs of the inhabitants, first in India, later in Borneo, Egypt, the Philippines, and elsewhere in the Old World. His skill as a military expert attracted the attention of the Khedive who appointed him a colonel in the Egyptian army.

While serving in this capacity Colonel Hilder's sight was seriously impaired ; this led to his resignation, and coming to America during the Civil War, he rendered notable service for the Engineer Corps. For many years after the Rebellion he engaged in business which led him again to many parts of the world, particularly to South America, where he visited almost every civilized settlement and many that were not civilized. Settling at St Louis after 1871, he became interested in the mounds of the Mississippi valley, and the collections obtained through personal excavations (some of which are now in the National Museum) are noteworthy for their representative character and for the intelligent manner in which they are catalogued. By reason of his intimate knowledge of the Spanish language, Colonel Hilder rendered valuable service to the Bureau of American Republics in its early days ; later he contributed articles on education in South America to the reports of the Commissioner of Education, and in 1899 became ethnologic translator in the Bureau of American Ethnology, which position he held at the time of his death. During the winter of 1899–1900 Colonel Hilder visited the Philippines under the auspices of the United States Commission for

the Pan-American Exposition, making a valuable collection of ethnologic and other objects for exhibition at Buffalo. On his return to Washington he continued to completion the translation of a manuscript history of Texas—prepared anonymously but attributed by Colonel Hilder to Fray Agustin Morfi in the latter part of the seventeenth century—and had begun its annotation when overcome by his final brief illness.

Ever courteous and generous, endowed with learning of that substantial sort which comes with long and intimate acquaintance with the wide world, Colonel Hilder made many friends who courted his companionship for their personal gain in knowledge and for the ennobling influence of a good man. F. W. H.

Jipijapa or Panama Hats.—Ecuador is the real home of the hats wrongly designated under the name of "panama," and according to the *Recueil Consulaire Belge* this industry afterward extended to Peru and other countries, even to Yucatan in Mexico. Everywhere in Latin America the hat is known under the name of *jipijapa*, in honor of the city where its manufacture was first started. It is only in Europe or outside of the producing countries that this hat receives the name of a city which does not make it. The finest hats are made in Jipijapa and at Montecristi, in the province of Manabi, Ecuador, this industry being one of the greatest resources of the country. The *toquilla*, or leaf of a small plant, is used for this purpose. It grows abundantly in the country, the leaves coming up in the shape of a fan. The plant is the *Carludovica palmata*. There are jipijapas of all qualities, from those costing a few pence to those worth several pounds. The merit of these last, really marvels of fineness, consists as much in the scarcity of the straw as in the difficulty of the weaving, and therefore it is exceptional to find these hats on the general market. The hats of current sale cost a few shillings, the finest not exceeding from five to six pounds sterling in price. In buying a panama it is necessary to ascertain two things—that the straw is whole and that it is not stiffened. It is not easy to recognize this first condition. In order to make two from one, the weavers split the straw with such perfection that unless a person is accustomed to such examinations it is almost impossible for him to distinguish the difference. Of equal fineness the hat made from whole straw is worth three or four times the one manufactured from the straw that has been split. The second condition is easily recognized, for the hats are stiffened to make the straw firmer and white. Good toquilla is white and stiff enough not to need any gum, and only ordinary panamas are stiffened.—*Journal of the Society of Arts*, London, August, 1900, p. 744.

Twine-making without Apparatus. — An observant lady friend, who had been traveling in southeastern Alaska, gave me the following description of two-ply twine-making by a Tlinkit woman: "All the fingers on both hands are used in the operation. In beginning, a small bundle of filaments is doubled and the middle loop grasped between the thumb and forefinger of the left hand. The two ends are brought downward on the palm and held in place by the fourth and fifth fingers. One of the ends is then seized between the thumb and the first two fingers of the right hand and twisted several times. This end is then brought down upon the palm of the left hand and held in place by the fourth and fifth fingers, so that it cannot untwist. At the same time the other end is taken up by the fourth and fifth fingers of the right hand and passed over to the thumb and forefinger of the right hand, when the operation of twisting is repeated, first one strand and then the other. The two ends are then grasped with the fingers of the right hand and twined two or three times, and at the same time the thumb and forefinger of the left hand help in the twisting. Seizing the band or loop in the right hand, it is drawn forward so as to take up the finished part of the twine. Fresh filaments are added, and the operation goes on as long as necessary, the completed twine being wound into a ball."

In the *Fourteenth Annual Report* of the Bureau of Ethnology, Dr Hoffman describes quite similar twine-making, by the Menomini, from the inner bark of young lindens. In this example, however, the two ends are held on the thigh, near each other, and twisted simultaneously with the palm of the hand, while the looped end is held between the thumb and forefinger of the left hand. These fingers also aid the twisting.

OTIS T. MASON.

Study of the Romance Languages and Literature, especially of the earlier periods, will receive a powerful impetus through a society recently formed in Europe, with Prof. Dr W. Foerster, of Bonn University, as president. The society will engage in editing and publishing early manuscripts and in reëditing and printing early classics that have become practically inaccessible through their extreme rarity. The works of the authors who wrote in old French before and after the thirteenth century, the Italians of the period of Dante, Tasso, and Ariosto, the Spanish dramatists, and the leading contributors to Portuguese and Provençal literature, as well as those of the seventeenth and and eighteenth centuries will be reproduced. The great obstacle in such a study—the scarcity of the most important ancient poems, dramas, and collections of popular songs—will largely be surmounted

through the coöperation of such scholars as K. Vollmöller of Dresden, G. Baist of Freiburg, F. A. Coelho of Lisbon, R. M. Pidal of Madrid, A. Morel-Fatio of Paris, and a score of others. Among the first of the literary monuments to be reproduced is the "Search for the Holy Grail" (*A demanda do santo Graal e a morte del rrey Artur*), the oldest known Portuguese prose classic; this will be followed by five Italian comedies dating from 1524 to 1537, and three Spanish comedies of 1550–51; the recently discovered *Tercera parte de la Silva de Varios Romances*, 1551; the *Cancionero de Constantina*, a rhymed chronicle of the Cid, the comedies of Lope de Vegas reproduced from the original of 1604–47, and many others. The publications of the society will be distributed by its treasurer, Fr. Junge, of Erlangen, Germany.

A. S. GATSCHET.

Miles Rock, one of the founders of the Anthropological Society of Washington, died at Guatemala City, Guatemala, February 1st. Mr Rock was born in Ephrata, Pennsylvania, October 10, 1840. He attended the local school and the Lancaster High School, and was a student of Franklin and Marshall College until the outbreak of the Civil War. After serving throughout the war, he entered Lehigh University, whence he was graduated in 1868 as a civil engineer, and in which he taught mathematics and mineralogy during the year 1868–69. In 1870 he went to Cordova, Argentina, as astronomical assistant in the observatory, and during the next three years was engaged in mapping the stars of the southern heavens. From 1874 to 1877 he was attached to the United States Hydrographic Office; in 1878 was an assistant on the Wheeler Survey, and from 1879 to 1883 was an assistant astronomer of the United States Naval Observatory. From 1883 to 1898 Mr Rock was the head of the Guatemala Commission to determine the Mexico-Guatemala boundary, and his faithful and intelligent labors in this direction were so highly appreciated by the Guatemalan government that at the time of his death it took charge of his remains, and unusual public honors were bestowed at the time of his funeral, which was directed personally by President Cabrera. During the early years of the Anthropological Society of Washington Mr Rock manifested deep interest in its welfare. At its sixth meeting, held May 20, 1879, he read a paper on "Indian Pictographs in New Mexico," and late in the same year he presented a memoir "On the Effacing Power of Tropical Forest-growth in Trinidad Island."

Conscious Word-making by the Hupa.—The Hupa Indians of northern California have a custom which compels them to form new

words and to discard the old ones. After a burial ceremony is completed it is a serious offense to utter the name of the deceased in the hearing of a relative. It often happens that the name is that of some common animal or object, when a new designation must be invented, at least for use in the presence of the relatives of the deceased. If the new name happens to "take," or the person who had been called by the old one was prominent in the tribe, the change will be likely to be permanent.

Three instances of this have come to my notice. The old word for wild goose was *h'ā*. An important man known by that name having died some years ago, the word has largely gone out of use. The young people know only *tlĕ-kŭnch-yĕ-dĕ-tĭ'-lĕ*, "the one that likes salt." Nearly all the Indians say *mitl-kĕ-ō-hat*, "what one buys with," to avoid *nă-dĕ-au*, the older word for money. A woman having lost a relative who bore the name *djō-kjō*, "grouse," employs the poetical expression *wĭt-wăt-yĕtl-tchwĕ*, "the flour-maker," from the similarity of the sound of a grouse's drumming and the noise made in pounding acorns. This process of word-building in the course of a few centuries may have largely changed the nouns of the language.

PLINY E. GODDARD.

Cushing's Zuñi Folk-Tales.— A committee consisting of Major J. W. Powell, Miss Alice C. Fletcher, Dr Franz Boas, Mr Stewart Culin, Dr George A. Dorsey, and Professor W. H. Holmes, with Mr F. W. Hodge as secretary, is planning to have published, by a prominent New York house, a handsome, illustrated volume containing more than thirty folk-tales which were recorded and translated by the late Frank Hamilton Cushing during his long and intimate association with the Zuñi Indians of New Mexico. The printing of the volume will be begun as soon as advance orders sufficient in number to guarantee the cost of production have been received. As there is little likelihood that the volume will be reprinted, those who desire a copy should communicate immediately with the Secretary of the committee, at Washington, D. C. The subscription price has been fixed at $3.50, payable on delivery of the book.

Eskimo Stone Implements.—Rev. H. R. Marsh, formerly a Presbyterian missionary at Point Barrow, Alaska, but now at Joliet, Illinois, informs me that around Point Barrow, among the Eskimo, stone is called *o-ya'-hak*, jade is *ĭs-ig'-nak*, and flint is *añ-mak;* hammer is *kaw-tak*, adze is *u-li-maw*. The stone adze or the flint of the woman's skin-scraper is called *ku-kia*. No matter what the material, if put to the same use, the same word is employed: that is, an adze might

be of nephrite, flint, or any other stone, but its name would invariably be *ku-kia*. An adze handle is called *ka-te-lo'-a*, an ax or hammer handle is *i-po-a*, a pail handle is *ne-go'-me-o-ta*. THOMAS WILSON.

BY THE WILL of the late Professor Edward Elbridge Salisbury, Yale University will receive on the death of Mrs Salisbury a certain part of the residue of the estate, the amount being estimated at $150,000. One-half of the sum is to provide an additional income for the Salisbury professorship of Sanskrit and comparative philology, and the other half is to accumulate until it reaches $100,000, when the income is to be used for such purpose as the trustees may determine.—*Science.*

ANTHROPOLOGY AT HAVANA.—The dean of the faculty of science and arts of the University of Havana has assigned the chair of anthropology to Dr Louis Montané, a disciple of Quatrefages and Hamy and a pupil of Broca. It is said that Dr Montané is completing the preparation of a work which has for its object the description of skulls of Indians of Cuba which he discovered at Baracoa and Guantanamo, in the province of Santiago.

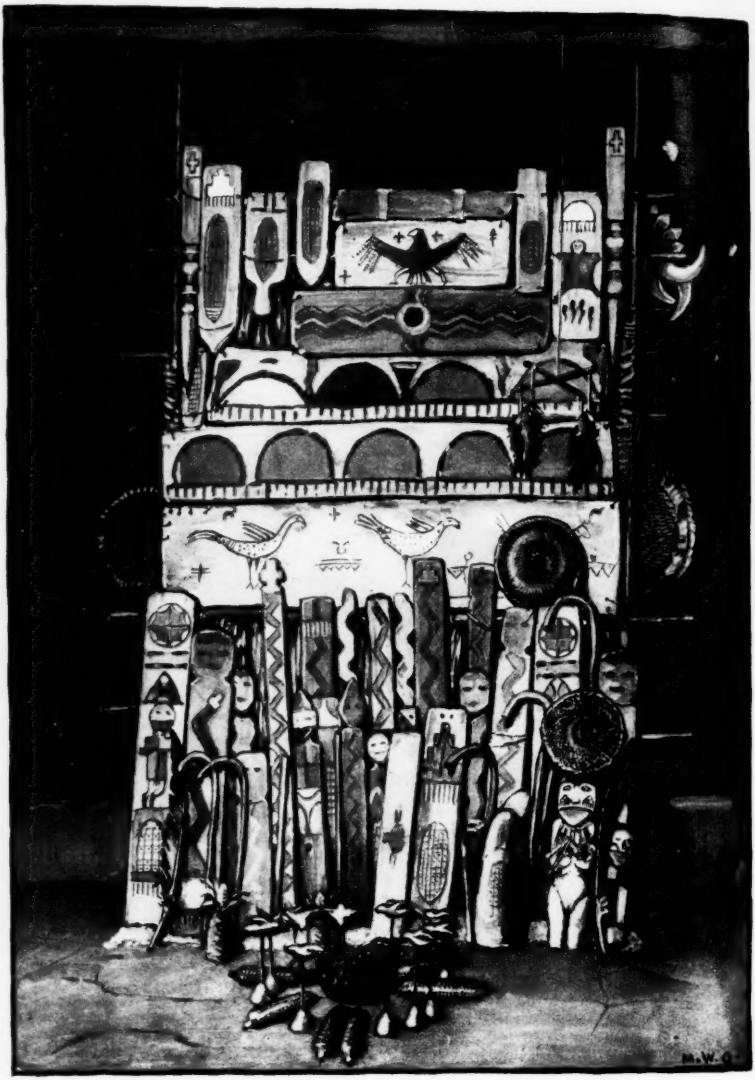
THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE has granted £10 for excavations at Silchester, £30 toward the archeological survey of Canada, the balance (amounting to £10) of a previous appropriation for the purchase of photographs of anthropologic interest, £5 toward anthropological teaching, £145 for explorations in Crete, and the balance in hand under a former appropriation for determining the age of stone circles.

MICMAC-ENGLISH DICTIONARY.—Of the Micmac Dictionary prepared by Rev. Silas Tertius Rand, who died in 1889, only the English-Micmac volume was published (Halifax, 1888, 4°). The Canadian government has now planned to publish the Micmac-English part under the editorship of Mr J. S. Clark, of Bay View, Prince Edward Island.

A "BIBLIOGRAPHY OF CHILD STUDY FOR THE YEAR 1899," by Louis N. Wilson, of Clark University, has been reprinted from vol. 7, pp. 526–556, of the *Pedagogical Seminary*. The Bibliography comprises 441 titles and a subject index.

THE UNIVERSITY OF CAMBRIDGE, England, has accepted a collection of ethnological specimens formed in the Maldine islands by Mr J. Stanley Gardiner. The collection will be deposited in the Museum of Ethnology.

THE DEATH of Dr Hippolyte-Jean Gosse, professor of legal medicine at the University of Geneva, and Director of the Archeological Museum of Geneva, on February 22d, in his 67th year, has been announced.



OWAKÛLTI ALTAR AT SICHOMOVI